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THE AMERICAN ASSCCIATION OF ORTHODONTISTS,
ITS COMPONENT SOCIETIES, AND
THE AMERICAN BOARD OF ORTHODONTICS

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Vol. 34 **AUGUST, 1948** **No. 8**

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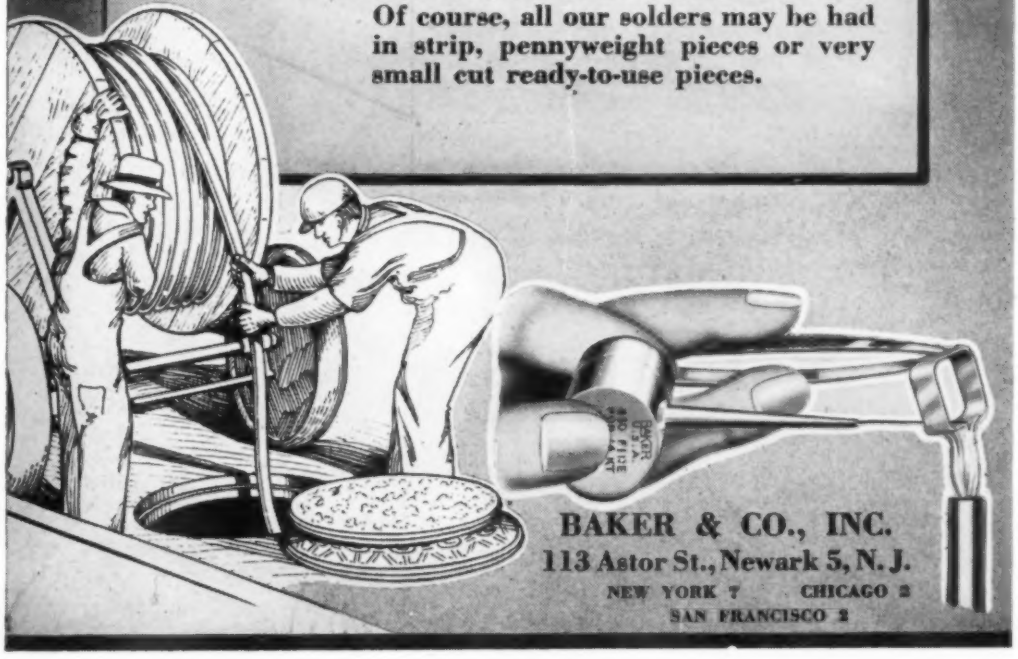

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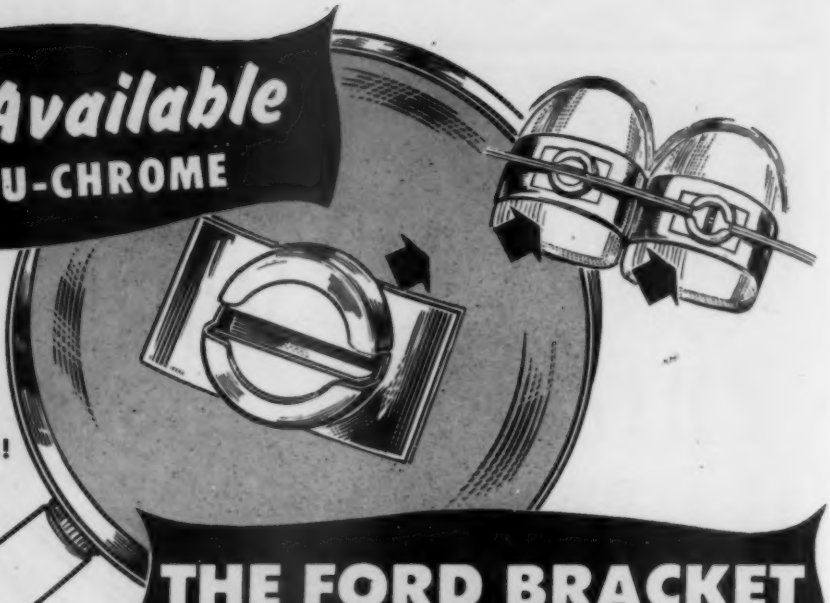

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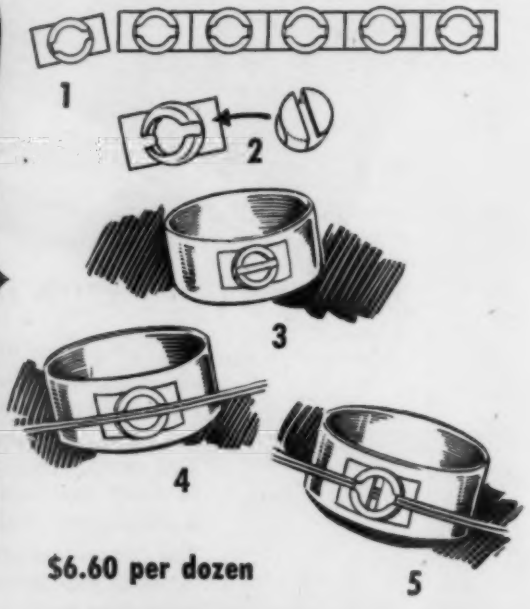

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Lowrie J. Porter, President, American Association of Orthodontists
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American Journal
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VOL. 34 AUGUST, 1948 No. 8

Original Articles

PRESIDENT'S ADDRESS

AMERICAN ASSOCIATION OF ORTHODONTISTS

EARL G. JONES, D.D.S., COLUMBUS, OHIO

ONE OF the privileges of this office is the opportunity to invite and entertain the Association in one's home town. I hope you are finding Columbus hospitable and a pleasant place to spend a few days. I can assure you that we of the various committees are enjoying the role of hosts.

Being President of this Association has been a real pleasure. I would be remiss if I failed to credit the operation of this meeting to the several committees who have organized and coordinated it. Each has had his job to do and has completed it well. I would like to congratulate the Association on having had the services of Dr. George Anderson, Dr. George Moore, and Dr. Fred Black, our Program Committee. The untiring work of Dr. Anderson in organizing and correlating this fine program has been an inspiration. Likewise, Dr. Black has performed a fine service in procuring the many splendid clinics for Thursday afternoon. The untiring work of Dr. Fred Aldrich on general arrangements, registration, and golf has been of great help. Dr. D. C. Miller has contributed to our income and convenience by providing twenty well-chosen commercial exhibits. Dr. Robert E. Wade is doing an excellent job of providing equipment for essayists and clinicians, as is Dr. James R. Hull who is in charge of our dinner dance. All of the men and their committees have contributed largely to this meeting.

I would like also to take this opportunity to congratulate this body on having had the council and guidance the past several years of our efficient Secretary-Treasurer, Dr. Max E. Ernst. He has been a source of great help to your President in the administration of the affairs of the Association. While his services as Secretary will be lost to us, we will have his council as President-Elect and President in successive years.

The activity of this Association being confined quite largely to the annual meetings leaves very little to account for. District meetings have afforded pro-

Presented at the Forty-fourth Annual Meeting of the American Association of Orthodontists, Columbus, Ohio, April 26-29, 1948.

grams which have been outstanding and equal in caliber to the essayists and clinicians of our American Association. It is natural that each program committee should be ambitious for the success of their meeting, and procure top-notch programs. The difficulty comes in finding enough new material of quality to supply semiannual programs. The suggestion has been made that district meetings might be held on alternate years with the American Association. I am not willing to jeopardize the interest in either society by making meetings biennial.

It was my good fortune to attend a meeting honoring Dr. Joe Johnson of Louisville last spring. It was largely attended, and much interest was shown especially by the younger men who are eager to learn. A part of the meeting time at district meetings might well be spent giving refresher courses and amplifying different techniques. Many young men are now interested in orthodontics. Their opportunities for acquiring orthodontic knowledge are quite limited. Study clubs and refresher courses may be very beneficial.

For many years I have been actively interested in orthodontic education. I am sure I voice the sentiment of all orthodontic teachers when I say that *orthodontic teaching has been and still is a highly controversial subject.*

Orthodontics as all other phases of the healing arts was largely acquired through preceptorships, and has been mechanistic in principle and practice. As the specialization grew, theory involving the fundamentals of biology became more necessary to the understanding of orthodontic procedures. We of the orthodontic profession are extremely fortunate that the early years of our development were guided by men of outstanding ability. Few specialties have such a rich heritage as ours. These men realized full well the difficulties encountered in the correction of even the so-called simple malocclusions. For this reason mainly, undergraduate training has been discouraged.

The progress of dental education has been steady and effectual until now our basic training is on a par with the fundamental biologic education of all branches of medical science. This means that so far as basic training is concerned, undergraduate dental students are well equipped to understand the problems of growth and development of the masticatory apparatus. However, another problem enters the picture, that of sufficient time in the crowded undergraduate curriculum to present and demonstrate the mechanistic phases of the subject.

This was made increasingly so through the years of accelerated training during the last war. Many schools by virtue of the shortage of teachers and lack of adequate time were forced to forego all clinical orthodontic training. This condition has scarcely been changed since the conclusion of hostilities which is resulting in the establishment of graduate and postgraduate courses in many of the leading dental schools of the country.

The program I feel is a step in the right direction. Orthodontics has never been looked upon as a necessary part of undergraduate work by the dental profession. It has always been regarded as an independent specialized practice. I can agree in part with this assumption; however, I will never agree to make orthodontics an entirely postgraduate study. There is no other subject in the

dental curriculum which reviews and correlates all biologic and technical phases of dental undergraduate study as does orthodontics. A well-organized and well-taught course of study in the fundamentals of orthodontic principles, the growth and development of the head and masticatory apparatus, as well as preventive measures incident to malocclusion are absolutely necessary to a complete dental education and a prerequisite for graduate or postgraduate study.

The nature of undergraduate study in dentistry makes it difficult to formulate adequate graduate courses. Students in other colleges are able and expected to elect a certain number of hours in a major subject which provides a fundamental for advanced courses taught in the graduate school. A dental student studies a prescribed curriculum. He has no advanced training; consequently, many courses open to other graduate students are not available. This applies to courses in genetics, anatomy, physiology, physics, and other subjects necessary to research. Time should be available in the undergraduate schedule to allow a student to elect courses leading to advanced work, and credit should be given toward a graduate degree.

The difficulty in the recommendation of the Council on Dental Education of the American Dental Association for specialization is that schools are not equipped with adequate teaching staffs or facilities to provide two years' postgraduate instruction, and it hardly seems possible that a sufficient number of schools can comply in the next six or eight years to care for the number of students wishing to enter specialized fields of study.

The prescribed period of two years' study in graduate or postgraduate courses for specialization has been modified, however, by the Council until such time as the schools can qualify. In the meantime, students may be allowed credit for work done in hospitals, clinics, dispensaries, and preceptorships under the direction of certified specialists, or fundamental science laboratories recognized by the Council and by the specialty examining boards as competent to provide adequate training in the special field.

The variation of fundamental training and the problems involved in the practice of the various specialties make the application of standardized regulations and qualifications impossible. Standards which may be applicable to prosthodontia, periodontia, or oral surgery certainly do not apply in the didactic or clinical training of an orthodontist. The modus operandi is entirely different.

Certainly without any thought of discrediting the general knowledge or ability of the individual members of the American Dental Association Educational Council, I must confess that it seems to me to be highly improbable that a committee without the representation of an orthodontist can evaluate the needs and wishes of our specialty in regard to problems or prerequisite training for specialization.

It would seem to me more logical that the Committee on Orthodontic Education of the American Association of Orthodontists should develop a program satisfactory to us, and let it be the guide for the Educational Council of the American Dental Association on matters pertinent to orthodontics.

Our American Board of Examiners was highly complimented by both the Council on Dental Education and also the Reference Committee of the American

Dental Association for the splendid work done in accreditation. The American Board of Orthodontics is the oldest accrediting board and should be used as a pattern for other boards to follow.

It was generally agreed by the Council and Reference Committees that it should be the general policy of the American Dental Association to favor the certification of specialists approved by the several examining boards of the specialties. I am pleased to say that in Boston I was given the assurance that for the time being our Board would not be interfered with in any way, and that their decisions and recommendations will be fully supported by the Council on Dental Education of the American Dental Association.

I am certain that I voice the opinion of our membership when I say, "We are proud of our AMERICAN JOURNAL OF ORTHODONTICS." The prophecy of Dr. Charles Mayo to Dr. C. V. Mosby that a group of men practicing a new phase of dentistry called orthodontics would some day contribute quite largely to the dental health and social security of the nation led Dr. Mosby to interest himself in our welfare. To that end and to make a dream come true, we have had through all these years his help, financial and otherwise, to perpetuate our proceedings and literary contributions. We have now reached our goal, our own monthly publication devoted entirely to orthodontics.

It seems significant that the first number of our JOURNAL should be dedicated to the memory of and as a tribute to the untiring achievements of Dr. Milo Hellman. His research and devoted teaching endeared him to his many friends, and orthodontics will ever be more enriched because of his great contributions. The preparation of the material in the *Memorial Number* is the result of the efforts of many of Dr. Hellman's close friends and of the able assistance of Dr. Joseph D. Eby, Sectional Editor of the Northeastern District.

I should also like to call attention to the valuable services of Dr. H. C. Pollock, who has served this Association as Editor-in-Chief for many years, and to the sectional and associate editors who have assisted Dr. Pollock in the direction of our publication on the high plane which it has achieved.

Due to the division of Oral Surgery and Orthodontics into separate journals, our contract with the publisher has been revised and is ready for confirmation at this meeting. I assure you we are fortunate to have the entire cooperation of The C. V. Mosby Company. The direction and policy of the JOURNAL remains as in the past, strictly in the hands of our Association. I should like to emphasize to all concerned that we, the American Association of Orthodontists, are in *entire* control of our publication, and enjoy the most cordial relations with our publisher.

The interest of the Children's Bureau of the Federal Security Administration in developing a program for public orthodontic health service for children was manifest at a conference held in Washington June 12 and 13, 1947. It was my privilege together with Dr. Broadbent, Dr. Higley, Dr. Moore, Dr. Salzmann, Dr. Cooper, Dr. Klein, and Dr. Knutson to participate in the discussions. Basic principles for the operation of the program were formulated.

The bureau is quite interested in providing a program of education in prevention and interception of malocclusion by advanced training for general den-

tists, emphasis on growth and development taught the undergraduate student, and the development of an intelligent appreciation of all others interested in child health and welfare.

The plan embraces immediate service programs, priority being given to severe dentofacial deformities and those conditions which misdirect growth and which cause interference in development.

The operation of the plan will be administered on a state level under the direction of an advisory committee which will pass upon qualifications of orthodontists participating, priority of cases for treatment, and standards for insuring quality of care. The program if administered as outlined, will give orthodontic care to indigent children. I recommend that the American Association of Orthodontists support this program by giving counsel and guidance.

At the last regular meeting of this Association, the Committee on Orthodontic Education was instructed to make a study to the end that a uniformity in undergraduate and graduate study be formulated. This is highly important. It involves considerable understanding between the orthodontic teachers, the American Association of Dental Schools, and our Committee on Orthodontic Education. In order that sufficient time may be had for this study, a conference is being called. The recommendations of the group should be of great value to the educational committees of the American Dental Association and the American Association of Orthodontists in determining the prerequisites for specialization.

It has been my privilege during my term of office to attend several of the district meetings. In the discussions at the business sessions, my attention has been drawn to the discrepancy in the prerequisites for membership. Inasmuch as membership in the districts is the basis for ultimate membership in our Association, and should be in harmony with our prerequisites, I would recommend that a committee be named to investigate and determine the qualifications for associate and active membership in the districts which will be uniform in defining membership for the American Association.

The growth of our Association has been steady through the years. In the thirty years which I have been privileged to belong to this organization, I have seen it increase from less than one hundred to the present membership of more than nine hundred members, one hundred and twenty of which have been added this year. With the interest of returned veterans and graduates in the field of orthodontics, I predict a rapid enrollment in the next few years. If this be true, it may be well that we look to the future.

The services of past officers and especially the secretaries and treasurers have been a work of sacrifice and devotion. They have contributed largely to our advancement. I cannot help but feel, however, that we are now reaching a place in our Association which calls for added duties and responsibilities of a secretary. I do not believe we can expect one of our members who is busily engaged in practice to devote sufficient time to administer the varied duties which should be performed by a central office. It has been my experience that a secretary can be as busy in administration affairs as he wishes. It is surprising how many activities a well-trained lay secretary can find to do in the promotion

of an association. I believe in the future the district societies should receive more help in administration, public relations, records of membership, and correlation of programs and meetings. Responsibilities are bound to multiply with our increase of membership and complexity of operation. I am not recommending an immediate change, but I do think we should anticipate our increased needs and obligations, and be formulating plans.

In the past it has been the policy of the Association to frown upon commercial exhibits at our meetings, only a few being invited to defray expenses of local arrangements. Inasmuch as this is a contact which affords our membership opportunity to purchase materials and equipment and at the same time is a source of income, I recommend that well-selected manufacturers' exhibits be encouraged at our meetings, and that the income go directly to the Treasurer. This will necessitate an ample budget for program, clinics, local arrangements, and entertainment which is not being provided at present. It is not good business to administer our meetings on miscellaneous income which is not received and disbursed through the treasurer's office of our Association.

The amendments to the Constitution and Bylaws presented at the Colorado meeting, I heartily concur in. Especially should we approve the recommended change in our method of election. When our Association was small, nominations from the floor were satisfactory; however, we have now attained a membership which should receive careful consideration as to the proposed candidates for office in our Association. A nominating committee composed of a representative from each district as suggested seems to be fair and efficient. I recommend the change.

And now may I say in closing, it has been an honor which I shall forever cherish to have served as President of the American Association of Orthodontists. It has been my wish as your representative to conduct the office as efficiently as you would have done had opportunity smiled upon you as it has upon me.

I trust you will have a profitable meeting, and an enjoyable stay in Columbus.

185 East State Street.

THE CONSULTATIVE PERIOD

JAMES DAVID MCCOY, D.D.S., BEVERLY HILLS, CALIF.

DOUBTLESS many members experienced a feeling of surprise when they opened their programs and noted that the first paper of this session carried the title, "The Consultative Period." Some may even have reacted by thinking that a discussion of this subject could have been omitted. I trust, however, I may claim your interest through a brief period in considering what appears to me to be one of the most important contacts the orthodontist makes. Since the general theme of a large portion of our program is concerned with "the passage of a patient through an orthodontist's office," naturally the consultative period initiates this experience.

Viewed in its proper light, its importance should take precedence over many other contacts made between the orthodontist, the patient, and last but not least the parent or parents of the child to receive orthodontic benefits. Unless these latter can be brought to a realization of the exacting nature of the orthodontic problem and the part the patient must play in supplying his or her contribution to the teamwork which must exist, satisfactory results will all too frequently lie in jeopardy. To allow parents to assume the attitude of blind faith in the orthodontist simply because he is a man of good reputation and standing in the community is a thing to be guarded against in spite of the fact that such an attitude is flattering to the practitioner. A false sense of security from such a source can lead to disaster. It is, therefore, of paramount importance that all concerned in this initial conference shall understand fully that the benefits from orthodontic treatment are as much dependent upon what the patient is willing to put into it in the way of effort and cooperation as upon the skill and wisdom of the practitioner.

In order that these facts and others which will be mentioned later may be fully covered, "the consultative period" should be arranged at a time of the office day when it can be conducted without rush or flurry. Since most orthodontic patients are school children, the afterschool hours are extremely busy and should be reserved for regular routine treatment procedures. It is essential, therefore, that a time be selected when a period of thirty minutes may be allotted to each patient coming for consultation. The hour suggested for this important service is two o'clock, with the consultor being made the first patient of the afternoon. This means, of course, that the child must be kept out of school, which suggestion nearly always brings some degree of argument from the interested parent. However, a tactful secretary with the ability to stand firm and give the obvious reasons why such a patient must be seen at this hour will, in the vast majority of instances, bring about the acceptance of the time allotted.

Read at the Forty-fourth Annual Meeting of the American Association of Orthodontists, Columbus, Ohio, April 27, 1948.

In order to accomplish any given task, one must have the proper "tools to work with." If the consultative period is to be made a success, these are rather numerous. First of all, the consultation room should be pleasant and well lighted, with a color scheme which is generally pleasing. It should be large enough so that the patient and the parent or parents may be ushered in without

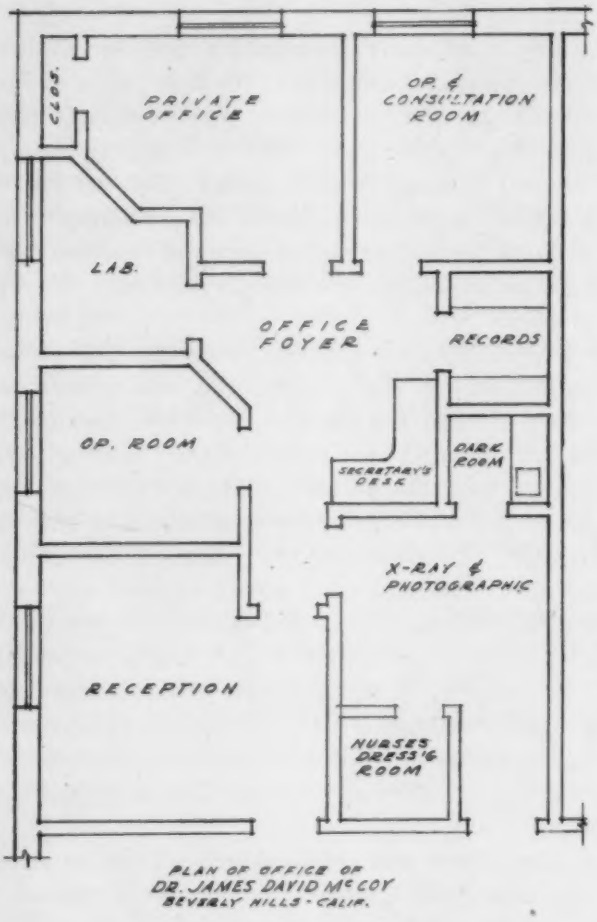


Fig. 1.—An office arrangement favoring ease of procedure. All rooms open upon a foyer favoring inter-room movement. The consultation room is also a duplicate operating room and is of comfortable size.

crowding. The secretary informally introduces the parent or parents and then the patient before they enter the room. In the consultation room, chairs are provided for the parents who are immediately invited to be seated, and then the patient is made comfortable in the dental chair. An office arrangement favoring this manner of procedure is shown in Fig. 1. Prior to this the secretary has filled out the consultation card at least to the extent of having the child's name as well as that of the parent properly spelled so that there need be no errors in pronunciation. By greeting the child by his first name, the atmosphere of friendliness is made more apparent so that the details of making a routine ortho-

dontic checkup lose any semblance of austerity. In my opinion, an important factor in creating helpful reactions on the part of the patient is the costume of the orthodontist. It has been found that if cold-white can be avoided by utilizing a jacket or uniform in an off-white ivory or light blue-gray, children will not associate you with the surgeon or any of our other medical confreres whose ministrations sometimes cause pain and induce fear. Such costumes may be just as attractive and just as clean as if they were made of cold-white material.

One of the primary objects of this first visit is to determine whether the patient needs orthodontic treatment with reasonable promptness, is a borderline case which should have subsequent observation, falls into the category of needing no treatment whatsoever, or is one which can be treated to better advantage from the patient's standpoint six months or a year or two years later. Sometimes such decisions can be made from careful intraoral and extraoral studies, but properly made roentgenograms are in many instances indispensable. While they serve many purposes, they are of special value in computing the "dental age" of the patient, which we know does not always parallel the chronological age. Therefore, in conducting the study of a child, let us say, 9 years of age with twelve permanent and twelve deciduous teeth present, carefully made lateral-jaw roentgenograms will give us abundant information. Since orthodontic appliances are essential in the majority of cases coming under our care, the timing of our treatment assumes great importance in determining how long they must be worn. If we are to depend upon the eruption of certain groups of permanent teeth before active treatment measures can be terminated, knowledge of the status of crown and root development of these teeth as well as the process of resorption of deciduous roots is essential. This would be especially true in cases in which we wish to take advantage of growth spurts within the dentofacial area.

Therefore, one of the important tools referred to is adequate x-ray equipment preferably in a room devoted to this purpose alone, with facilities and adequate potential not only to make the usual intraoral roentgenograms but also the extraoral type frequently referred to as lateral-jaw pictures. These are by far the most useful of all x-ray pictures to the orthodontist, for when made in keeping with the rules of a well-known technique, the presence or absence of unerupted teeth is immediately made evident, their relative positions in the maxilla or mandible are shown, and the status of development of crowns and resorption of deciduous roots are clearly indicated. In other words, the dental age of the patient is made evident. At the time most patients are brought for consultation, the upper and lower permanent incisors have erupted. Naturally if any of these teeth have not put in their appearance, intraoral roentgenograms may be resorted to. If a third molar checkup is necessary, these may be clearly shown in their proper relationship to other structures with additional extraoral exposures. This prevents the necessity of subjecting the child to the discomfort and gagging frequently induced by placing films so far back in the mouth. The avoidance of any pain in this early association with the patient is of paramount importance. By using an intensifying screen, such exposures may be made with

the timing factor reduced to the point at which clarity and detail are favored. By covering one side of the cassette with a metal plate, the exposures of the right and left sides may both be made upon a 5 by 7 film. Metallic letters are used to identify each side. Such pictures are illustrated in Figs. 2 and 3.

The aforementioned procedures require but a few moments' time, and while the films are being developed by the orthodontic nurse, our consultation proceeds to the intraoral and extraoral study of the patient's teeth and dentofacial areas. Naturally, a suitable consultation card is employed on which unusual conditions found may be jotted down or the usual conditions having clinical bearing are printed and need only to be checked. One side of the card, which should be of ample size, contains all such informative data, while the opposite side is arranged suitably for the business transaction where treatment is undertaken. In this way, requirements for filing space are kept at a minimum. Both sides of this card, which is five by eight inches in size, are shown in Fig. 4.

Since the secretary has already indicated the name and age of the patient as well as the name, address, and telephone number of the parents, these need not be the concern of the orthodontist. An intraoral study of the form of each dental arch is observed, as well as the relationship of the opposing dental arches and their supporting structures, the maxilla and the mandible. These findings are indicated upon the consultation card. A brief history and findings having clinical significance are then proceeded with. By this time the roentgenograms have been developed and briefly studied so that we know whether or not we are dealing with the normal number of teeth, a deficiency, or a dental redundancy. Of particular importance is our study of the tongue, for we know that when there is a definite macroglossia present, the prognosis of treatment is definitely unfavorable. We then proceed to the extraoral study of the patient, noting the relationship of the lips, his or her manner of breathing, and the degree of tonicity of the orbicularis oris and its related muscles. The significance of these structures should be quietly explained to the parents, as well as the showings manifest in the roentgenograms, for if they can be brought to some realization of the complex nature of the orthodontic problem, their interest and cooperation are more likely to be sustained. When definite etiologic factors are uncovered or their influence suspected, these should be explained in simple and direct language to the interested parent and recorded upon the consultation card.

If the dentofacial anomaly possessed by the patient is one of those commonly encountered by the orthodontist and if the roentgenographic study plus the careful intraoral and extraoral study of the patient indicate that the logical time for treatment has arrived, a tentative treatment policy is outlined. Some feel that it is necessary to make study models and photostatic facial records before this step is taken. However it seems rather ridiculous to consider this necessary unless the patient possesses conditions far out of the ordinary. Certainly, such records should be made before a complete and final diagnosis is arrived at, and additional x-ray exposures may frequently be found advantageous. Among these, bitewing pictures are important especially in the mouths of patients in whom a medium or high incidence of caries is evident.

Fig. 2.

Fig. 3.

Fig. 2.—Extraoral roentgenograms which supply much valuable information for the consultative period.

Fig. 3.—Extraoral roentgenograms adapted for determining the status of the third molars.

ORTHODONTIC RECORD

PATIENT Brighton Bedford Jr DATE April 5 194 8
AGE 7 YEARS 3 MONTHS PHOTOGRAPHS File A
CASTS, CABINET 2 SHELF 8 NO 4

INTRA-ORAL DIAGNOSIS — **DIFFERENTIAL DIAGNOSIS**

Apparent Neutroclusion — See chart No.
X Apparent Distoclusion, Bilateral . . . . Unilateral
Apparent Mesioclusion, Bilateral . . . . Unilateral
Normal Occlusion for age period

HISTORY AND OBSERVATIONS

Teeth of Father—Normal, Abnormal, Degree mild
Teeth of Mother—Normal, Abnormal, Degree
Mouth of Patient
Soft Tissue—Healthy, Unhealthy
Incidence of Caries—Mild, Med., Ext.
Roentgenograms File A
Number of teeth—Normal, Deficient, Redundant
Non-vital teeth none
The Tongue—Normal, Microglossia, Macroglossia
The Tonsils—Normal, Pathological, Absent
General Health—Good, Fair, Poor
The Nose—Normal, Malformed
The Lips—Normal, Malrelation, Malformed
Breathing—Normal, Mouth
Facial Muscles—Normal Tone, Deficient
The 3rd Molars yes Checked
Weight Lbs. Height Ft. In. 194
Weight Lbs. Height Ft. In. 194
Remarks

ETIOLOGY OF MALOCCLUSION

Predisposing Causes

X 1 Acute infectious diseases
2 Chronic infectious diseases
3 Acute deficiency diseases
4 Chronic deficiency diseases
5 Metabolic disturbances
6 Endocrine unbalance
7 Prenatal abnormalities
8 Congenital defects
X 9 Heredity good
10 Unknown Causes
11 Other conditions

Determining Causes

12 Missing teeth
13 Supernumerary teeth
14 Transposed teeth
15 Malformed teeth
16 Abnormal frenum labium
17 Intra-uterin pressure
X 18 Premature loss of deciduous teeth
19 Tardy eruption of permanent teeth
20 Prolonged ret. of decid. teeth
21 Loss of permanent teeth
22 Dental restorations
23 Pressure habits—sleeping, lip, mouth breathing, tongue, posture
Refer to No.

PROGNOSIS

X Favorable, unfavorable
X Immediate treatment advised
Postponement of treatment advised
Subsequent observation advised
Self correction possible

THERAPY

Primary treatment
Max. Apl.
Placed 194
Removed 194
Mand. Apl.
Placed 194
Removed 194
Secondary Treatment
Max. Apl.
Placed 194
Removed 194
Mand. Apl.
Placed 194
Removed 194
Muscle Exercises advised
Cooperation r'cd.
Corrections of habits:
Surgery or other procedures

* most diseases of Childhood

FINANCIAL RECORD

PARENT Mrs Brighton Bedford REFERRED BY
(Billing) ADDRESS 123 Prosperity avenue Beverly Hills, California
PATIENT Brighton Bedford Jr. TELEPHONE Hillside 7-11 C.R.
ADDRESS

Fee, Primary Treatment $
Estimated Primary Treatment Period Months
Primary Treatment. Fee to be paid as follows:
$ 194 $ 194 $ 194
$ 194 $ 194 $ 194
Special arrangement
Estimated Secondary Treatment Period Years
Fee $ Per Year. To be paid
Letter Confirming Agreement 194
Oral Agreement with 194
Secondary Treatment Begun 194 Tmt. Dates
194 194 194 194 194
194 194 194 194 194
194 194 194 194 194
194 194 194 194 194
Re-cementation 194 194 194
194 194 194
Repairs
Retreatment necessary from 194 to 194
Arrangements
Notes

DATE	STATEMENT	DEBIT	DATE	CREDIT

Fig. 4.—Both sides of an office card five by eight inches in size. Consultation and clinical data are placed on one side, while the other records the business arrangement.

Among the "necessary tools" for the consultative period which are very effective in educating both the parent and the patient as to the nature of the orthodontic problem are certain exhibits composed of photostatic facial records of patients before treatment, during treatment, and when dentofacial structures have been placed in anatomical balance. Accompanying these should be the denture reproductions belonging to the facial pictures. In this way the growth factor is made evident and a new viewpoint of orthodontic treatment not usually possessed by the laymen is initiated. This will aid materially in most instances in gaining that indispensable necessity in orthodontic practice which we term "the cooperation of the patient." While we may have many disappointments in this connection and witness some heartbreaking failures many of which may be attributed to sheer negligence and carelessness on the part of the patient, we practitioners fall short of our obligations if we fail to emphasize, whenever the opportunity occurs, the full importance of the patient's obligations in the role of treatment.

Through the use of such exhibits, two of which are shown in Figs. 5 and 6, parents are quick to see the improvements in appearance which usually come to patients who have undergone successful orthodontic treatment. It is important, however, that they be made to realize that these do not always take place in equal degree, for under no conditions can we exceed the limits established by the hereditary pattern. Furthermore, in those cases in which marked dentofacial anomalies exist, such handicapping influences as the health status of the individual patient and its bearing upon future growth possibilities should be given emphasis. Here again is an opportunity to emphasize the harmful and retarding effects of pressure habits, whether they involve the tongue, the lips, the thumb or fingers, or some detrimental posture practice.

In cases in which treatment is indicated most, parents will wish to know the approximate expense entailed so that this brings up the necessity of discussing the business arrangement. This is a situation not to be shunned but made welcome for discussion. My own plan, after trying several others, and the one which I have found the most satisfactory is to take all cases upon an annual basis. A flat charge is made for the first year which is larger than the subsequent year, to provide for all the laborious effort included in the foundation work for treatment. This includes photostatic facial records, gnathostatic denture reproductions, all essential roentgenograms, and such orthodontic appliances as are indicated for the particular case. If treatment extends into the second year, a slight reduction under the first is usually made with only that part of a year which is consumed being charged for. For post-treatment care, a flat fee of $50.00 a year is charged. An initial payment of approximately one third of the first year's fee is required, and thereafter bills are rendered semiannually or quarterly for amounts due. For post-treatment care bills are rendered at the end of each year of such service. Bills for consultation in cases in which treatment is not to be undertaken are always rendered the first of the month following this important service. If a patient is to be recalled for observation let us say in six months, across the bottom of the statement is typed: "Subsequent observation advised . . . ," and the month and year for this return visit are stated.

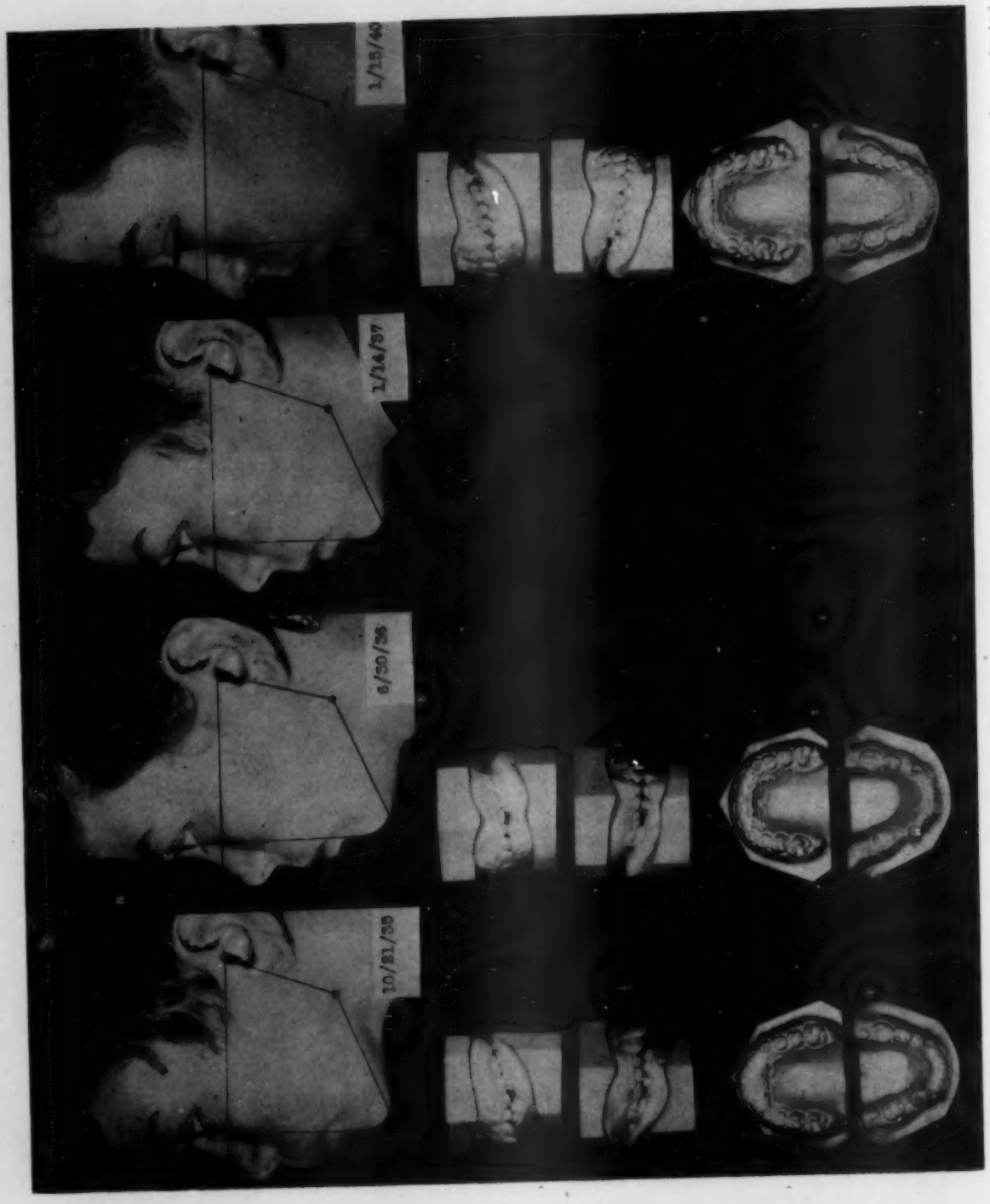


Fig. 5.—Photostatic records of a case recorded at intervals during treatment where favorable growth changes are demonstrated.

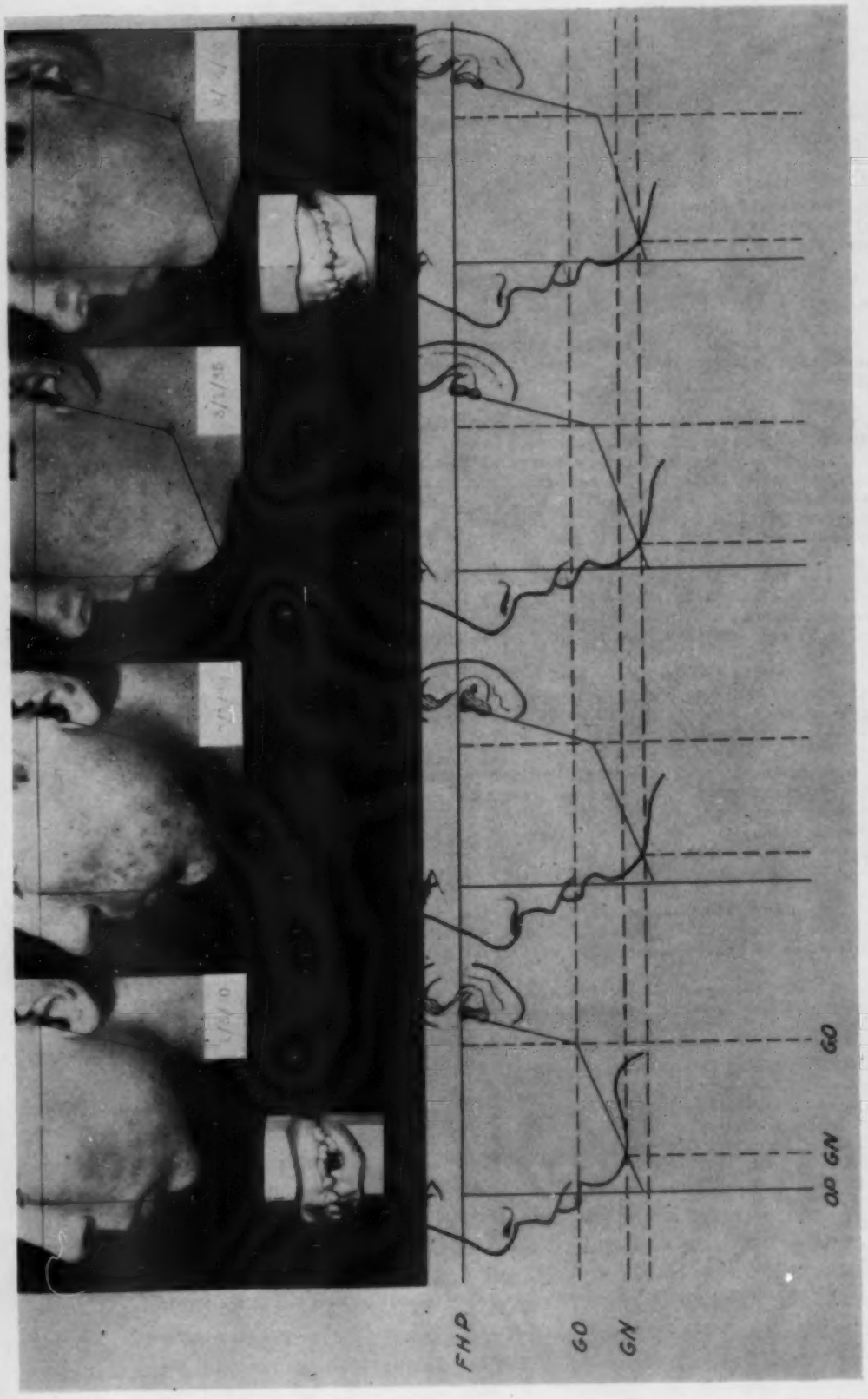


Fig. 6.—Photostatic records of a case recorded at intervals during treatment where growth changes are somewhat disappointing.

May 1, 1948

Mrs. Brighton Bedford
123 Prosperity Avenue,
Beverly Hills, California

Dear Mrs. Bedford:

In keeping with my usual custom, I am submitting a written statement of the cost of Brighton Jr's orthodontic treatment, with the terms of payment usually followed.

For carrying forward that phase of the work which we designate as "primary orthodontic treatment" during which the teeth, dental arches and jaws are established in their normal relationships, a charge of $—.— will be made for the first year, and if treatment extends into or beyond the second year, it will be at the rate of $—.— per year. The cooperation of the patient in keeping appointments, and following definite instructions is important in reducing the length of time required for treatment.

Following primary treatment, it becomes necessary to sustain the teeth in their new relationship over a sufficiently long period so that a relapse may be guarded against, and this we term "secondary treatment". For this period estimated at two or three years, a charge of $50.00 a year will be made.

During the secondary period of treatment, special appliances are made for the patient. If these are lost, and replacement is necessary the expense for their duplication will constitute an additional charge.

It is my custom to render a bill for the foundation work (estimated at $—.—) as soon as it has been completed, and for payments on account semi-annually for primary treatment, during the first year, and quarterly during the second year, if the treatment period proves to be that extensive. Bills for secondary treatment are rendered annually. The schedule appears upon the foot of this letter. In making charges upon an annual basis, it is understood that only that part of a year consumed will, in any instance, be charged for.

Your attention is called to, "Rules Applying To Patients Accepted For Treatment" attached to this letter, which I am asking you to read and keep for future reference. These rules if followed carefully will prove mutually helpful.

In the event I have failed to cover any point in connection with this arrangement which should be made more explicit, I shall be glad to do so upon request.

Very truly yours,

James D. McCoy

PAYMENTS: Primary Treatment,
$—.— $—.— $—.—
$—.— $—.— $—.— $—.—

PAYMENTS: Secondary Treatment
$50.00 $50.00 ?

JDM:mm

Fig. 7.—A letter of agreement sent when the first bill is rendered.

Bills for consultation should be the general rule. Even where exceptions are made in the cases of those to whom it is wished to extend professional courtesy, a statement should be sent, nevertheless, and marked "no charge." It might be noted here that the vacillating and timid attitude of many orthodontists toward a consultation fee has led to many impositions on the part of "shoppers" and an attitude lacking in esteem toward our specialty by the laymen.

May 15, 1949

Mrs. Brighton Bedford
123 Prosperity Avenue,
Beverly Hills, California

Dear Mrs. Bedford:

Brighton Jr's orthodontic treatment has been brought to the point where we may consider primary treatment as being completed, and for that reason I am rendering my bill showing the balance for this phase of his work. You will find attached a copy of my original letter of agreement which outlines the financial basis upon which this case was undertaken.

During the next period, which we term "secondary treatment", it will not be necessary for him to come to my office as frequently as heretofore. At present I wish to see him once a month and will give appointments on that basis.

I have supplied him with a removable appliance for the upper teeth, with instructions to wear it every night for an indefinite period. On the lower teeth a fixed appliance has been left which must be continued in use during secondary treatment.

It is very necessary that Brighton Jr., follow my instructions implicitly and give his fullest cooperation if the best end-results are obtained, for the importance of this phase of treatment cannot be overestimated.

Trusting I may have your sustained interest in this matter I am,

Very truly yours,

James D. McCoy

JDM:mm

Fig. 8.—The letter sent when primary or active treatment has been completed.

The first of the month following completion of the foundation work for treatment the first bill is rendered accompanied by a letter of agreement listing the terms and conditions under which the patient is being accepted for treatment. To fail to record these conditions in writing is an error which should always be avoided. When active treatment has been completed and the final bill for this service is rendered, a copy of the original letter of agreement is attached to another letter which outlines the duties and responsibilities of the patient during post-treatment care. This second letter is just as important as the first one. Copies of these two letters appear as Figs. 7 and 8.

Since orthodontic appliances and regular appointments are essential in the majority of our cases, definite instructions should be given not only verbally but prepared in written form and attached to "the letter of agreement." These should require the meticulous keeping of appointments, the proper care of the mouth so that appliances may be kept reasonably clean and the teeth protected, the avoidance of all sticky candy so that bands and arch wires will not be dislodged or their action interfered with that in the event of breakage notice be given immediately and a special appointment made for repairs, the time allotted being other than the afterschool period which is devoted exclusively to routine treatment appointments, and, finally, that the customary visits to the family dentist be continued without interruption.

An important part of the consultative period especially when immediate treatment is being planned is the arrangement of suitable appointments. The exacting nature of the foundation work is such that during the school year all such appointments should be arranged during the morning hours. It has been found better to arrange their sequence a week apart. It is required, therefore, that the patient come to the office at half past nine and remain until half past eleven on three different occasions, usually a week apart. In this way the exacting tasks necessary are accomplished with the minimum of wear and tear upon both the patient and the orthodontist. An important factor in this connection is our rule which requires the parent or governess to remain in the reception room or, better still, stay away from the office entirely during these appointments. No exceptions are made to this rule. As a matter of fact, in my reception room I have a sign which is shown in Fig. 9 and reads, "Except during consultation periods parents are requested to remain in the reception room while patients are receiving orthodontic treatment." This takes a burden off of the secretary and the orthodontist alike. We all know that children when taken by themselves make wonderful patients, whereas most of them if accompanied by a parent become restless, fearful, and sometimes impossible to work for.

One subject which need not be included except in a very brief way during the consultative period is the discussion of appliances. It is natural for a parent to assume that the orthodontist will use every means necessary to correct the anomalies possessed by the patient, and therefore it is not necessary for him to indulge in any promotional dissertation. To do so is in my opinion crude and smattering of the tinsmith age of orthodontics.

The consultative period, you will note, has a twofold purpose, namely: to make a preliminary appraisal of the patient's needs and to educate the parent or parents along lines which will favor successful treatment results. Among those things incompatible with such results is a frequent situation arising when a patient is sent away to boarding school. Many a case in a promising state of successful treatment has met its Waterloo in boarding school. This is a real problem and while no hard and fast rule can be laid down, I believe we are justified in refusing to take patients unless they will remain in our hands until primary treatment has been completed. This rule is followed in my office. Boarding schools in one's own community may prove an exception, especially if the headmaster or headmistress is in sympathy with modern health programs.

EXCEPT DURING CONSULTATION PERIODS
PARENTS ARE REQUESTED TO REMAIN IN
THE RECEPTION ROOM WHILE PATIENTS
ARE RECEIVING ORTHODONTIC TREATMENT.

Fig. 9.—The small sign which occupies a prominent place in the reception room.

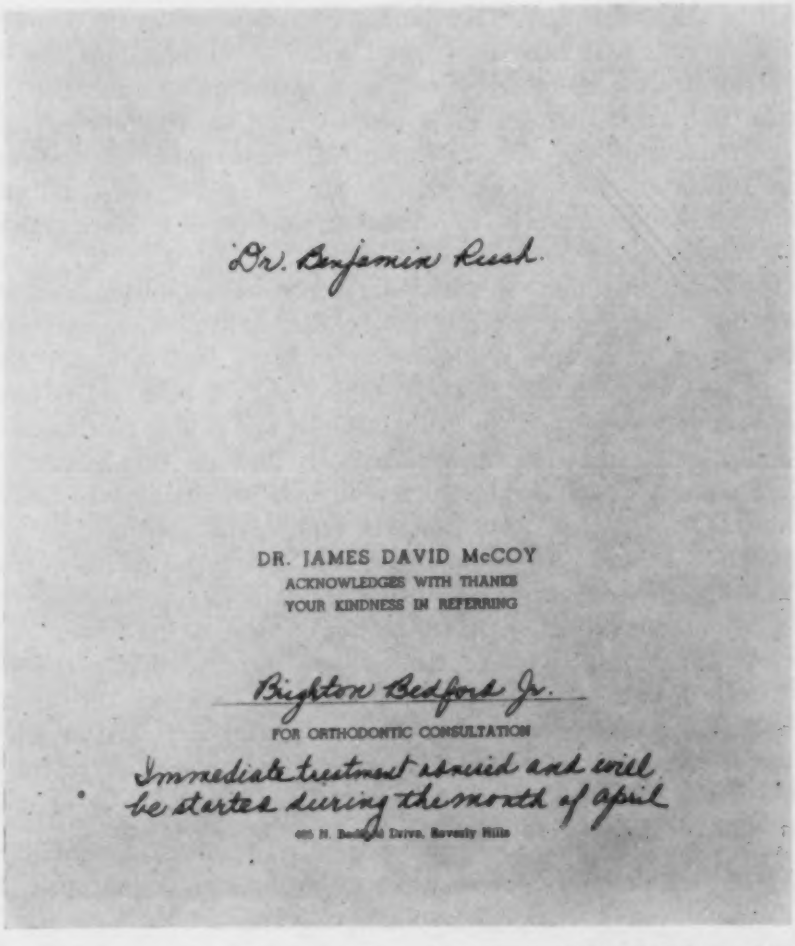

Dr. Benjamin Rush
DR. JAMES DAVID McCOY
ACKNOWLEDGES WITH THANKS
YOUR KINDNESS IN REFERRING
Brighton Bedford Jr.
FOR ORTHODONTIC CONSULTATION
Immediate treatment advised and will
be started during the month of April

Fig. 10.—A "thank you" card and also a means of sending a brief message of your findings.

Patients coming for consultation are either referred by professional friends or by families of former patients. Naturally we are desirous of saying "thank you" to those who have shown us this confidence and kindness. Therefore, a "thank you" card is mailed. This is prepared so that it folds over and fits into a medium-sized envelope. If to a physician or dentist, his name is written across the face of the folded-over card as shown in Fig. 10. When he opens the card the message of thanks is immediately evident, and in your own handwriting you include a brief message of findings so that he will know whether you have recommended treatment, and if not the reasons for your consultive opinion. Ordinary courtesy demands such action. If it is to say "thank you" to a layman, the same plan is followed except that as a rule your findings are not included.

The consultative period, especially in the offices of older practitioners, may sometimes lead to embarrassing situations. I refer to patients under the care of other orthodontists who wish consultation but seek to go about it the wrong way. An alert secretary will usually detect such consultors in the reception room, for they will usually say, "My daughter has been under the care of another orthodontist for the past two years and I want to find out how she is getting along." Naturally the secretary puts a stop to the proceeding then and there but informs the parent that she has a perfect right to consultation but it must come at the request of the other orthodontist. Sometimes such patients get as far as the consultation room where they are given the same dictum. It is unthinkable for one orthodontist to express an opinion of another man's patient without his full knowledge and consent.

Another situation which can cause static in the consultation room is created unwittingly by some of our friends in the dental profession who will give a patient the names of several orthodontists with the instructions, "Go talk to them all and see what they have to say." This admonition, if carried out, usually leads to a very much confused parent and patient. It can be eliminated when it is generally known that the consultative period is one which always must be paid for. Such consultors frequently reveal their intentions over the telephone at the time they make their appointments, and this imposition may usually be corrected then and there. This is made easy by asking the simple question, "Do you not find it rather expensive consulting several men?" Naturally this leads to further explanations which settle the matter one way or the other.

It might appear that some of the subjects introduced into this discussion are not directly a part of the consultative period. However, they lead directly from it or in some instances amplify it in a helpful way. After all, it is my feeling that the consultative period properly carried out and given the time and implementation it deserves will help smooth the whole pathway of orthodontic treatment, and add prestige to our specialty.

405 North Bedford Drive.

CASE ANALYSIS—INDICATED TYPES OF MALOCCLUSION

L. B. Higley, B.A., D.D.S., M.S., Iowa City, Iowa

IF AN unprejudiced, truth-seeking attitude is used to approach the orthodontic problem, it soon becomes evident that the deformities of the dental arches and face with which the orthodontist must cope may encompass a wide variety of conditions. It also becomes apparent that the etiological factors responsible for these dentofacial deformities are numerous, and that some are overlooked, or, occasionally, misinterpreted. Further study also indicates that identical maloclusions or interdigitations of the teeth are not of the same origin.

The purpose of this paper is neither to list systematically the procedure of a case analysis nor to attempt to point out the advantages of any diagnostic aid, but rather to discuss whether it is necessary to determine exactly what is wrong in a given deformity, and why, in some instances, there might be disagreement as to the true nature or type of the deformity. Since etiology will be presented later, this discussion will be confined primarily to morphologic considerations. It is generally agreed that a morphologic diagnosis is an attempt to discover whether the form, size, and relationship of the structures composing the face and cranium differ from those usually expected in that age level and sex.

At least three handicaps are apt to arise for some when the attempt is made to analyze just what type of deformity is presented. One of these handicaps concerns the perpetuation of the term malocclusion. By definition this term seems to restrict the consideration of the orthodontic problem to a very limited area. It would appear that the terms dental and dentofacial deformity might well be substituted and be more in keeping unless one assumes that deformities of the face do not influence the dentures and, conversely, that deformities of the dentures do not affect the face. If they do, then the term malocclusion is not sufficiently descriptive. That the face and dentures are interdependent is easily demonstrated in deformities complicated by malposition of the mandible.

Mandibular malposition usually results from tooth interference or loss of posterior tooth support. The condition may be noticed when the posterior teeth are in occlusal contact, or when, in the absence of the posteriors, the mandible overcloses. As the jaws separate, the mandible usually assumes a centric physiologic rest position, thus often eliminating the facial disfigurement. Although it is now believed that this malposition of the mandible can be in any direction, some find it difficult to consider the possibility of its being too far back. While discussing mandibular malposition, it might be well to emphasize the possibility of the mandible's continuing to close incorrectly even after the cause is removed. Ordinarily, if the tooth interference is outgrown or eliminated by orthodontic

Presented at the Forty-fourth Annual Meeting of the American Association of Orthodontists, Columbus, Ohio, April 27, 1948.

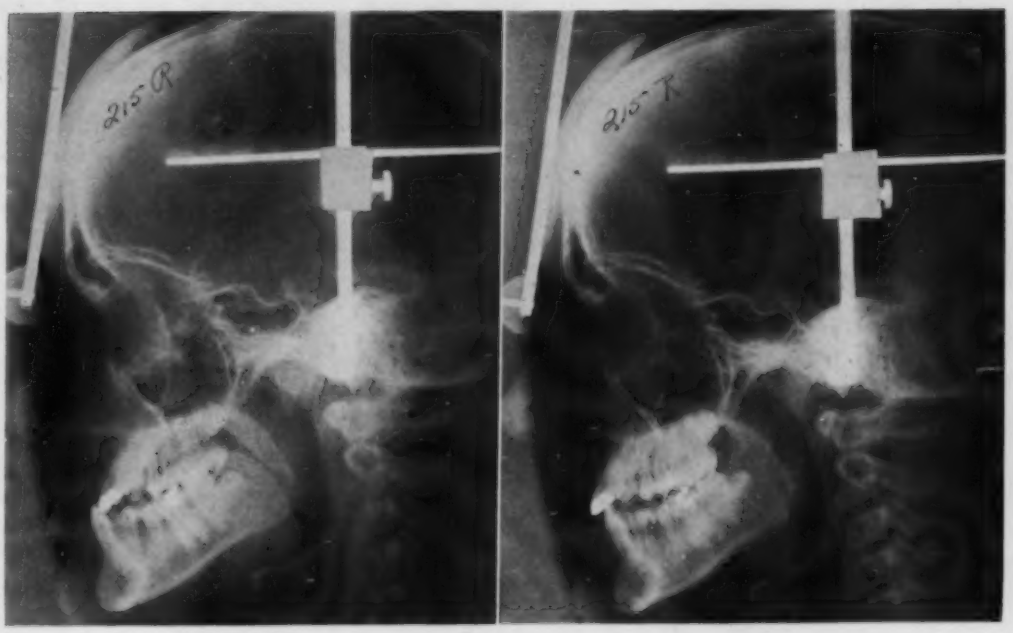
treatment, the mandible will automatically assume its correct position when the jaws are closed. However, the old muscular habit pattern may remain, causing the mandible to continue to close as it was obliged to do when the tooth interference was present.

An example of this is shown in the denture models and roentgenograms of a 14-year-old boy who earlier, because of tooth interference, had to position the mandible forward in order to obtain occlusal contact of the posterior teeth (Fig. 1*A* and *C*). When he came as a patient, this incorrect closure was continuing, due only to retention of the muscular habit pattern, since it was found that there was no longer any tooth interference, and that he could close with more masticatory efficiency with the mandible in correct anteroposterior position (Fig. 1, *B* and *D*). It is also possible that the mandible may not come forward from an incorrect posterior position for the same reason. Incidentally, it is this forward repositioning of the mandible in Angle Class II cases that is now considered by some to be responsible for the rapid treatment reported for certain of these dentofacial deformities. Others go so far as to state that it is only when repositioning of the mandible is obtained that any marked improvement of facial esthetics occurs and a stabilized result is achieved.

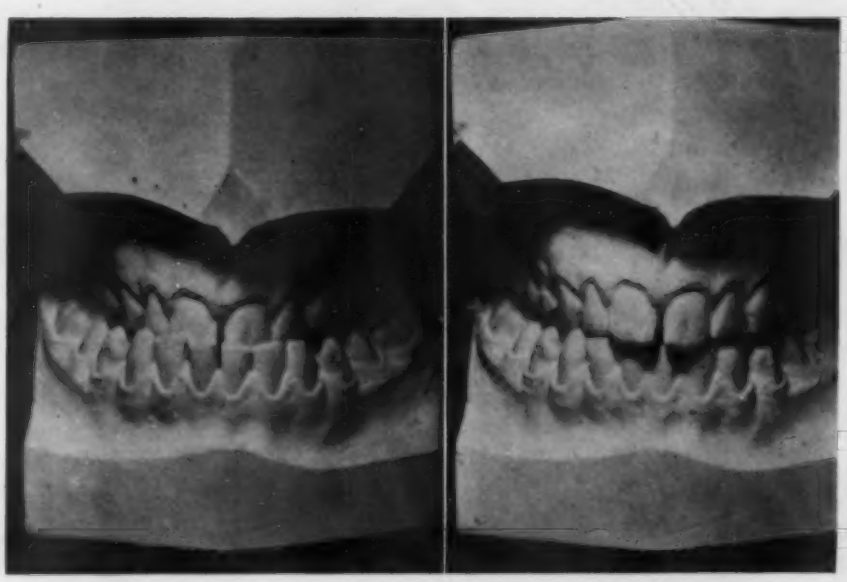
A second handicap in the determination of the exact type of dental deformity centers around the use or misuse of classifications, and deserves somewhat more discussion. When used incorrectly, classifications are also likely to limit or inhibit investigation and analysis of existing conditions. A classification in conversation or writing is supposed to supply a convenient brief means of grouping together deformities which have certain similar symptoms and which, possibly, require a somewhat similar treatment. The very nature of a classification allows of no more. Some orthodontists attempt to justify the adequacy of a classification to portray exactly how a specific deformity varies from the normal. Those who do must assume that all deformities which appear similar are truly so. Others find it much simpler to classify immediately the obvious symptoms, or, in other words, place them in certain categories and perhaps thus avoid having to use judgment or discrimination as to the exact nature or type of the deformity.

In considering dentofacial deformity it is well to start with the premise that any symptoms or combination of them may be possible. With this in mind, it is then necessary to determine whether the discrepancy is one of size, form, or position of the various structures, and exactly which structures are abnormal. For example, consider the various conditions suggested by numerous investigators, which might produce the type of interdigitation of the posterior teeth referred to in the Angle classification as Class II, Division 1 malocclusion. We find that:

1. The mandible and its superimposed dental arch may be normal in form and size, but upon closure be in distal position with respect to the maxilla and cranium for the following reasons:
   a. The condyle may be up and back too far in the glenoid fossa.
   b. The fossa may be up and back too far in the skull with the condyle in normal or distal position within it.



A. *B.*



C. *D.*

Fig. 1.—Malposition of mandible, or convenience bite. *A*, Retention of the habitual muscular pattern results in the forward mandibular position taken by the patient, with accompanying forward displacement of the condyle; *B*, normal mandibular and condyle positions obtained in biting back as instructed; *C*, occlusion when closed in the abnormal forward mandibular position; *D*, improved occlusion when the mandible is back in normal relationship to the skull.

2. The mandible and its superimposed dental arch may be in distal relationship to the maxilla and cranium because the body or ramus of the mandible may be too short.
3. The mandibular teeth may be distally positioned on an otherwise normal mandible.
4. The gonial angle may be too acute, resulting in the menton being closer to the condyle than usual which, in turn, would cause the mandible to appear short.
5. The maxillary posterior teeth may be positioned mesial to normal.
6. Combinations of two or more of these conditions may be present.

Thus, it is evident that pertinent information concerning such a variety of conditions responsible for a similar interdigitation of posterior teeth cannot be included in a classification. Nevertheless, classifications remain useful when their limitations are recognized.

These first two handicaps can be overcome very easily by substituting terms of more inclusive connotation for malocclusion and by admitting that a classification does not denote a complete diagnosis or analysis of an existing deformity.

A third and much more important handicap in the determination of the specific type of deformity presented is the lack of agreement as to what constitutes the normal in dentofacial relationships. Tweed,[1] for example, makes the following rather paradoxical statement: "Though difference of type should be considered, my vision of the normal allows of no variation; it seems a piece of precision machinery." Ryan,[2] on the other hand, wonders whether individuals having body builds suggestive of the endomorph, mesomorph, or ectomorph would not have the same morphologic tendencies in the skull. McCloy[3] contrasts the anthropoid type of individual with the ultrahuman, describing the body build as quite different, with the face and dentition being placed anterior to the cranium in the anthropoid type of skull (Fig. 2), but well back under the cranium in the ultrahuman face (Fig. 3). Angle,[4] in 1906, illustrated a skull (Fig. 4) which he described as typical or normal for those having a straight line profile, which is similar to the ultrahuman type, and another (Fig. 5) which would simulate a pronounced anthropoid type. The dentofacial relationship of this latter skull was also considered normal by Angle.

Margolis and others have illustrated bimaxillary prognathism in the Negro, which Margolis[5] states is normal for that type (Fig. 6). To consider these anthropoid facial tendencies, especially bimaxillary prognathism, as normal may be at variance with the investigations of Atkinson,[6] from which he concludes that "for normals of all types the mesiobuccal root of the upper first molar conforms to the graceful curve of the Zygoma or Key Ridge." This relationship does not exist in one well-known skull, namely, "Old Glory," in which instead the distobuccal root conforms to the curve of the zygoma (Figs. 2 and 7). This is undoubtedly a Negro skull but is only one and does not necessarily disprove the extensive investigations of Atkinson. It does, however, indicate that when this skull was named "Old Glory," little attention was paid to facial or skull type because emphasis was so deeply centered upon malocclusion or the interdigitation of the teeth. Klaatsch[7] and Pfaff[8] do disagree with Atkinson when

Fig. 2.—"Old Glory," an anthropoid or prognathic type of skull. Note the convexity of the curve of the dental area as compared with that in Fig. 3. The distobuccal root of the upper first molar conforms to the curve of the zygoma.

Fig. 3.—Ultrahuman type skull. Note that the curve of the dental area is concave as compared with that in Fig. 2.

they point out that in prognathic races the distal roots of the maxillary first molars are usually situated in the zygomatic crest and that in the case of orthognathism usually the mesial root is so situated.

Fig. 4.

Fig. 5.

Fig. 4.—Angle described this skull as having a "straight line profile" consistent with type. Similar to the ultrahuman type. (From Angle, E. H.: Items Interest 28: 431, 1906.)

Fig. 5.—Angle described this skull as having Nature's beautiful plan of normal occlusion and facial balance with type. (From Angle, E. H.: Items Interest 28: 433, 1906.)

From these and the observations of others it may be concluded that, since the dentofacial type may be in keeping with the morphologic tendencies of the entire body, it is well to consider the orthodontic patient as a whole. It has been suggested, however, that while certain races may exhibit more tendency toward either the anthropoid or ultrahuman body build, any race may include both. It has been further suggested that the skull type does not necessarily have to be in keeping with that of the body. In any event, it may be concluded

Fig. 6.—Bimaxillary prognathism. Negro girl, aged 25 years. Normal for that type. (From Margolis, H.: Am. J. Orthodontics and Oral Surg. 28: 771, 1942.)

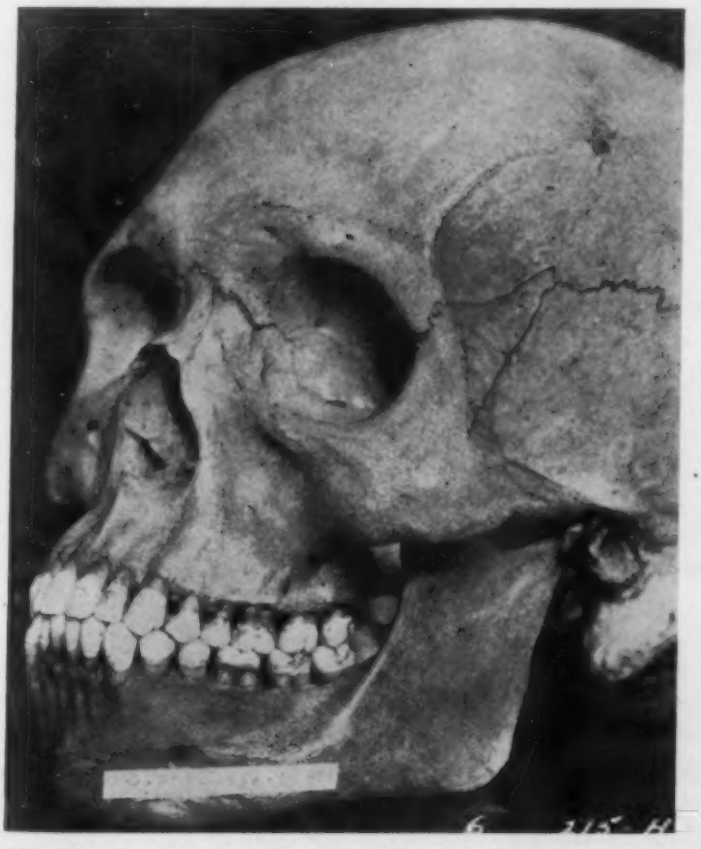


Fig. 7.—"Old Glory," prognathic type of skull. The lower incisors are vertical with respect to the mandibular base plane. The upper incisors have more than the usual labial inclination and the distal root of the upper first molar conforms to the curve of the zygoma. (From Strang, R. H. W.: Lea & Febiger, 1943.)

from all of the aforementioned that individuals do not inherit the same dentofacial and cranial relationships, and that it may not be possible by treatment to make them all look alike. If it is true that anthropoid or bimaxillary prognathic dentofacial relationships are normal for certain individuals, it is necessary when a patient presents what appears to be this condition to determine whether the condition is expected for his type or is truly an induced dentofacial deformity. This may be difficult, if not impossible. Fig. 8 illustrates such a case.

Fig. 8.—Bimaxillary prognathism. White man, aged 24 years. Is this normal for this type or is it an induced bimaxillary prognathism? Mandibular body short and lower incisors apparently procumbent.

Regardless of whether we can diagnose the condition as a deformity or simply as characteristic of a type, the fact remains that the dentition is not, according to present standards, in acceptable equilibrium with the face and cranium. However, the dentures are stable and illustrate the fact that at least procumbent incisor teeth must depend largely upon the musculature for their support rather than upon an upright position over the basal bone. Incidentally, it may in time be decided that stability of the dentures is more dependent upon their relationship to the musculature than to the basal bone of the jaws. This certainly must have been true for the mandibular incisors in the skull illustrated in Fig. 5 if these dentures were stable rather than in a state of flux.

If we could forget type and consider all bimaxillary prognathism as true deformity, the problem would be greatly simplified. This deformity is described

by Strang[9] as a failure of the bony base to grow forward sufficiently to assure correct relationship of the teeth to their osseous basal structures, while Tweed,[13] Margolis,[5] and others also associate procumbence of the incisors with the condition.

Fig. 9.

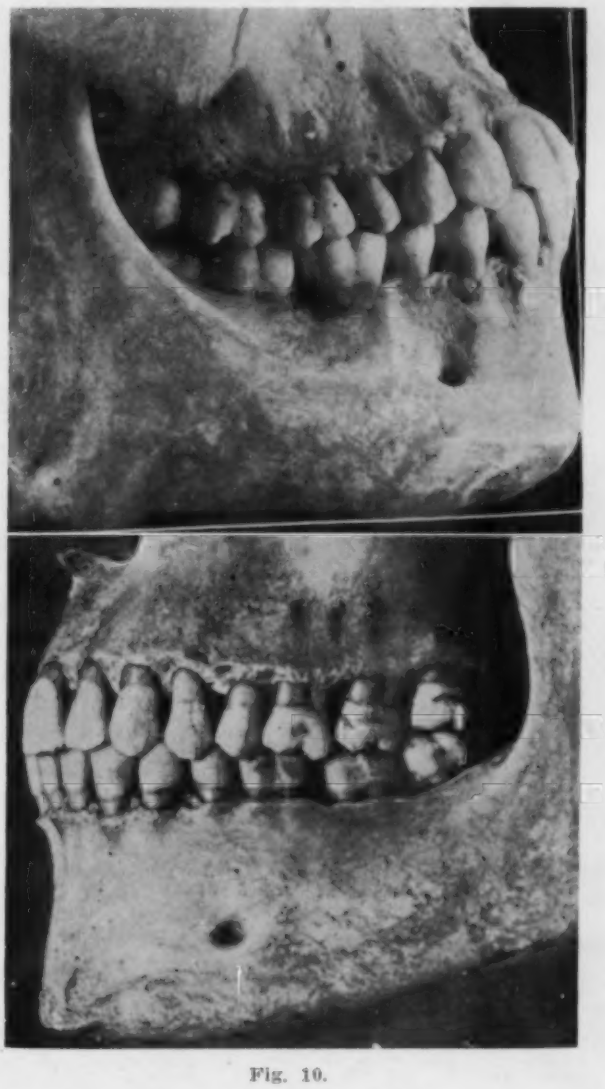


Fig. 10.

Fig. 9.—Normal occlusion? Probably be considered a type of bimaxillary prognathism by present-day standards. Mandibular body of good size with lower incisors vertical and flush with menton. The curve of the zygoma descends to cover the distobuccal rather than the mesiobuccal root of the maxillary first molar. (From Strang, R. H. W.: Lea & Febiger, 1943.)

Fig. 10.—Normal occlusion?. Probably be considered a type of bimaxillary prognathism by present-day standards. Mandibular body of good size with lower incisors vertical and flush with menton. (From Strang, R. H. W.: Lea & Febiger, 1943.)

Fig. 8 is apparently a good example of all these conditions. In an effort to keep this apparent deformity from becoming more severe, the third molars had been removed before we saw the patient. Strang[9] states, "From the viewpoint of clinical procedure the problem of bimaxillary prognathism resolves itself into

a forward relationship of dental units to their basal structures," and concludes, "Treatment must be planned with this thought in mind." This means, of course, that the teeth, especially the incisors, must be carried back to a correct position over the basal bone. Whether the change in relationship between the musculature and the incisor teeth thus produced will allow these structures to regain equilibrium so that the teeth become stabilized in this new position will depend upon the adaptability of the musculature. In order to carry the incisors back onto basal bone of insufficient size, some sacrifice of teeth is necessary. However, unless this quantitative inconsistency between bone and tooth substance is the sole cause of the deformity, the removal of the teeth will not guarantee a stabilized result. All other etiologic factors must also be discovered and eliminated.

One of the most important contributions to orthodontic diagnosis and treatment was that made by Grieve,[10] Tweed,[1] and others when they pointed out that insufficient basal bone support produces a forward drift of the teeth and, particularly, that much orthodontic treatment was contributing further to the condition. Accompanying this was the unsightly bulging effect of the lips. Unfortunately, however, some operators give the impression that this battle of the bulge is the only serious orthodontic problem.

The prognathism shown in Fig. 8 is indeed a good example of insufficient basal bone support for the teeth and procumbent incisors. There are two other types of this deformity that have decidedly different morphologic relationships or characteristics. In both of these the body of the mandible is of good size and the mandibular teeth usually have sufficient room for good alignment because they are positioned well forward. The mandibular incisors may be somewhat procumbent in one type as illustrated in Fig. 6, but often in the second type are vertical with respect to the mandibular base plane. Often the maxillary incisors, however, do have a decided labial inclination. The skull "Old Glory" (Figs. 2 and 7) and several other textbook examples of so-called normal occlusions (Figs. 9 and 10) illustrate this latter type of deformity; that is, they do if it is correct to assume that these so-called normal occlusions would be judged bimaxillary protrusions by present-day standards. The roentgenogram of a 19-year-old patient (Fig. 11) also shows these relationships very well. If these latter cases are considered bimaxillary protrusions, it is obvious that they could not be diagnosed by determining the inclination of the mandibular incisors. Actually, the forward position of the incisors relative to the bony chin point is the important consideration for these cases. When the mandibular teeth are positioned well forward toward the chin point, there will naturally be more room for them anterior to the ramus than when they are positioned farther posteriorly. However, the result of this forward position may contribute to an appearance of bimaxillary protrusion and, therefore, not be acceptable.

The position of the teeth on the mandible, especially of the incisors in relationship to the chin point, should have diagnostic significance for dentofacial deformities other than the prognathic type. Contrast the proximity of the incisors to the chin point in Figs. 12 and 13 with the position of the incisors in Figs. 3 and 11. In all of these, the maxillary and mandibular posterior teeth

are in correct interdigitation, but the mandibular incisors in Fig. 11 are well forward, those in Fig. 3 are about average, and those in Figs. 12 and 13 are considerably back. Fig. 14 is a Class II (Angle) deformity in which the incisors are also well back. The inclination for all of them is approximately vertical with respect to the mandibular base plane. Although this paper is not one on treatment, these illustrations provoke one to ask whether it might be logical in such instances to carry the mandibular teeth to a more forward relationship to the basal bone.

Important as the amount of basal bone for the support of the teeth may be, it is also necessary in case analysis to emphasize the variation in the size of the teeth. An immediate reaction might be that they are one and the same, but, actually, this is not always true. The size of the head and, therefore, the jaws, may be as large as would be desired in proportion to the rest of the body, but the teeth may be unreasonably large or small.

Fig. 11.—Normal occlusion? Roentgenograms of a 10-year-old girl. Probably be considered a type of bimaxillary prognathism by present-day standards. Mandibular body is of good size with lower incisors vertical and flush with menton. Decided labial inclination of maxillary incisors.

Teeth that are too small are not considered much of a problem, but when they are too large, it is generally agreed that they will jumble, be forced off the basal bone, or become impacted. The mesiodistal crown widths of the teeth in the 7- and 10-year-old girls shown in Figs. 15 and 16 are all at least 1 mm. above the average size given by Black.[11] The head and jaw sizes appear consistent with the body build. The teeth in the 7-year-old are crowded and forward in relation to the basal bone, and the condition is complicated by protrusion of the maxillary incisors. Those in the 10-year-old are in fair relation

Fig. 12.

Fig. 13.

Fig. 12.—Angle Class I, Type 2 dental deformity. Correct interdigitation of posterior teeth. Mandibular incisors vertical but well back in relationship to menton.

Fig. 13.—Angle Class I, Type 2 dental deformity. Correct interdigitation of posterior teeth. Mandibular incisors vertical but well back in relationship to menton.

to the basal bone but are very jumbled. It might still be questioned whether the oversize teeth have much to do with the dental deformity, since the roentgenograms of the 10-year-old indicate congenital absence of all third molars and those of the 7-year-old, absence of all second and third molars. (Roentgenograms at a later age confirm this.) However, it must be remembered that at the time when the oversize teeth present were erupting into the oral cavity, the jaws had completed only the amount of anteroposterior growth expected for that age of the patient. This growth was not sufficient to allow correct alignment of the abnormal amount of tooth substance in even the reduced number of teeth. The jaws in the 7-year-old are gradually becoming amply large to support the teeth she has. Unfortunately, dental deformities of this type do not usually become self-corrective even though the basal bone is eventually sufficient to accommodate the teeth. Occasionally it is found that the mesiodistal crown widths of the teeth in the opposing arches are not compatible in size. This all indicates that it is necessary to measure the teeth as part of case analysis.

Fig. 14.—Angle Class II, Division 1 dental deformity. Posterior teeth interdigitate as usually described for this type. Lower incisors are vertical but well back in relationship to menton.

Thus far no one seems to have established the actual size that the basal bone must be to support a set of natural teeth of any given crown width. Cephalometric roentgenograms have helped by making it possible to look at the relationship of the teeth to the basal bone, but they do not allow accurate measurement of the basal bone in all dimensions. Until a convenient method is devised for this, a positive declaration that there is insufficient bone to support the teeth may be questioned.

Fig. 15.

Fig. 16.

Fig. 15.—Roentgenogram of a 7-year-old girl. The mesiodistal width of all permanent teeth present is at least 1 mm. above the average size given by Black. Congenital absence of all second and third permanent molars. Teeth appear to be in bimaxillary protrusion.

Fig. 16.—Roentgenogram of a 10-year-old girl. The mesiodistal width of all permanent teeth present is at least 1 mm. above the average size given by Black. Congenital absence of all third molars. Teeth are badly jumbled.

For measurements of the mandible it is hoped that a method now being tested at Iowa will prove of value. Briefly described, it consists of a pasteboard cassette and film cut to conform to the neck in order to allow them to be placed in contact with the base of the mandible (Fig. 17). Important landmarks of the bone and denture are then spotted with metal markers for later convenience in measurement, the x-ray tube is correctly oriented, and the exposure made. This, like all other diagnostic aids, will need to be evaluated and then used with discrimination and judgment for what it is worth.

Fig. 17.—Illustrating a roentgen method of obtaining the actual size of the mandibular basal bone.

Rather recently, Howes[12] proposed a provocative method for determining the amount of basal bone or apical base in either jaw, but applied it especially to the maxilla (Figs. 18 and 19). This may prove to be an important diagnostic aid, but there are at least two questions relative to it that warrant consideration. First, does the method actually measure the apical base, and, second, does the manner in which the maxillary arch narrows alter the validity of the method? Howes states that this apical base is above the level of the root apices, but indicates that his survey line may not reach the apical level (Fig. 19). This could mean that the alveolar process rather than the apical base is being surveyed, and this would be an area more likely to be affected by certain etiologic factors.

With this in mind, consider that the maxillary dental arch may narrow in two specific ways. One is in conjunction with a narrowing of the palate and, possibly, of the entire maxillary bone above the alveolar process, coupled with an increasing buccoaxial inclination of the posterior teeth as narrowing of the

dental arch becomes more pronounced (Fig. 20, *A* and *B*). This accentuated buccoaxial inclination of the posterior teeth would cause their crowns to lie proportionately farther outside the apical base line indicating that less and less expansion would be permissible as the dental arch becomes increasingly narrow (Fig. 21). A second type of narrowing of the maxillary dental arch is not accompanied by a narrowing of the palate or the maxilla proper. The posterior teeth in this type appear to have a more than usual linguoaxial inclination (Fig. 20, *C* and *D*). In such cases, the posterior tooth crowns would lie proportionately farther inside the apical base line, indicating that expansion would be permissible. Accordingly, the very narrow arch shown in Fig. 20, *A* and *B* should not be expanded, while the one shown in Fig. 20, *C* and *D* could be.

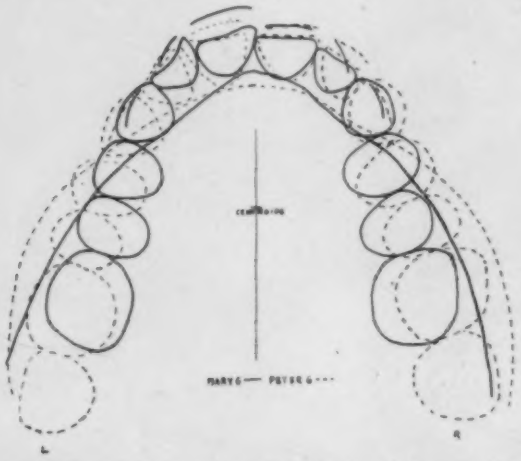


Fig. 18.—Map comparing maxillary apical base line of Mary and Peter and showing relative positions of teeth. Mary's posterior tooth crowns lie proportionally farther outside her narrow apical base than Peter's whose apical base is also wider. (From Howes, A. E.: Am. J. Orthodontics and Oral Surg. 33:521, 1947.)

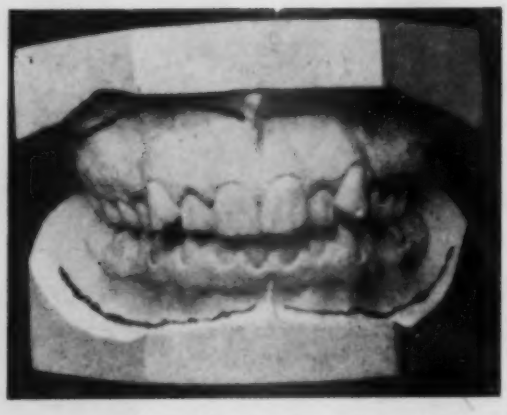


Fig. 19.—This shows the level of the survey or apical base line. (From Howes, A. E.: Am. J. Orthodontics and Oral Surg. 33:505, 1947.)

Short cuts to diagnosis are highly desirable, but, if improperly applied, they become dangerous. The Frankfort-mandibular plane angle proposed as a diagnostic aid by Tweed[13] has gained much popularity. It was previously

pointed out, however, that Tweed did not say that this angle is a definite criterion for extraction, although some choose to use it thus.[14] With less vertical ramus height, this angle moves forward, but the degree remains the same, while an increase in the obtuseness of the gonial angle increases the Frankfort-mandibular angle and also moves it forward. Neither of these conditions, however, necessarily indicates the actual size of the basal bone for the support of the mandibular teeth. Further study now in progress may show a correlation between this angle and mandibular basal bone.

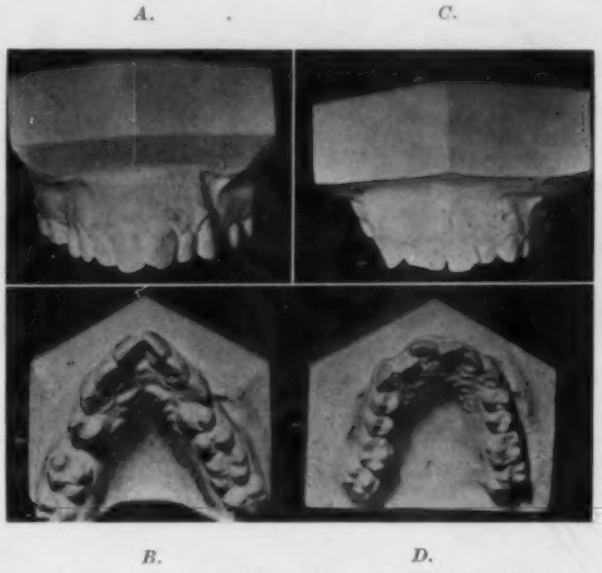


Fig. 20.—Illustrating two types of narrowing of the maxillary dental arch. *A* and *B*, front and occlusal views; *C* and *D*, front and occlusal views.

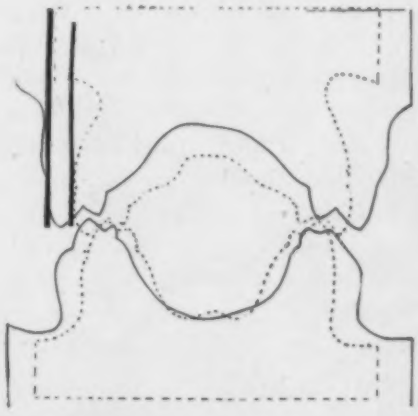


Fig. 21.—Map of cross-sectioned models of Mary and Peter. Heavy vertical lines have been drawn tangent to the left molar crowns. The line for the more narrow arch lies outside the apical base, and that for the arch of more normal width lies inside. (From Howes, A. E.: Am. J. Orthodontics and Oral Surg. 33:521, 1947.)

A large Frankfort-mandibular plane angle should indicate a large or obtuse gonial angle which undoubtedly has diagnostic significance. This is especially true if it is agreed that it is impossible to change this angle with treatment. For

example, the profile roentgenograms in Figs. 22 and 23 show the before and after treatment conditions for two children who originally might have been considered as having deformities of the Angle Class III type. Both were severe conditions, but the mandible was comparatively normal both in size and gonial angle in the child shown in Fig. 22, while the other child (Fig. 23) had an abnormally long mandibular body compared to the ramus with quite an obtuse gonial angle. The deformity in Fig. 22 treated rapidly since it was also found that the mandible was in malposition due to tooth interference which was eliminated in a few months allowing the normal mandible to assume its correct position with good esthetic and functional results. The deformity in Fig. 23 also showed marked facial improvement after a more prolonged period of treatment but little or no change in the mandibular size or shape. It is evident that these cases were fundamentally different and that the final result would never be as satisfactory for this latter case with the abnormally shaped mandible.

Finally, it seems appropriate to mention the care that must be exercised in the selection and application of diagnostic information gathered by those engaged in research. Research findings have contributed to our understanding of the size, shape, and relationship of normal and abnormal dentofacial and cranial structures. Certain diagnostic queries have been answered and some misconceptions eliminated by such investigative work. It is necessary, however, that these findings be obtained by carefully planned and executed methods, after which they must be correctly interpreted if they are to be of practical value. For example, at Iowa and elsewhere, mandibular measurements in Class II dentofacial deformity have been compared with those in normal and Class I cases. These studies have shown that when the average measurements for these three groups were compared, there was no significant difference in the ramus height, gonial angle degree, or glenoid fossa position, and only slightly less mandibular body length for Class II than for the normal and Class I groups. We now wonder whether these averages were not influenced too much by the variation in the over-all head size of the patients studied. That is to say, the average measurements for the parts studied might be quite different for the three groups rather than similar, if individuals were selected in each group who had approximately the same cranial base or over-all head size. The range for all measurements of the parts studied showed considerable spread, but was quite similar for each group. This may mean that it is more important to determine the actual size, shape, and position of these structures for each individual than to accept the idea that they are the same for all because the average measurements indicate this to be so. Naturally, this is not intended to belittle research, but to emphasize that the methods, findings, and interpretation of research should be questioned until their validity is established.

Many growth patterns and measurements of dentofacial structures supplied by research have become valuable aids to diagnosis.* Such normal standards, when used judiciously and in conjunction with predictable hereditary growth potentials, are of inestimable value in deciding whether the individual patient is average for his age and sex or falls above or below that.

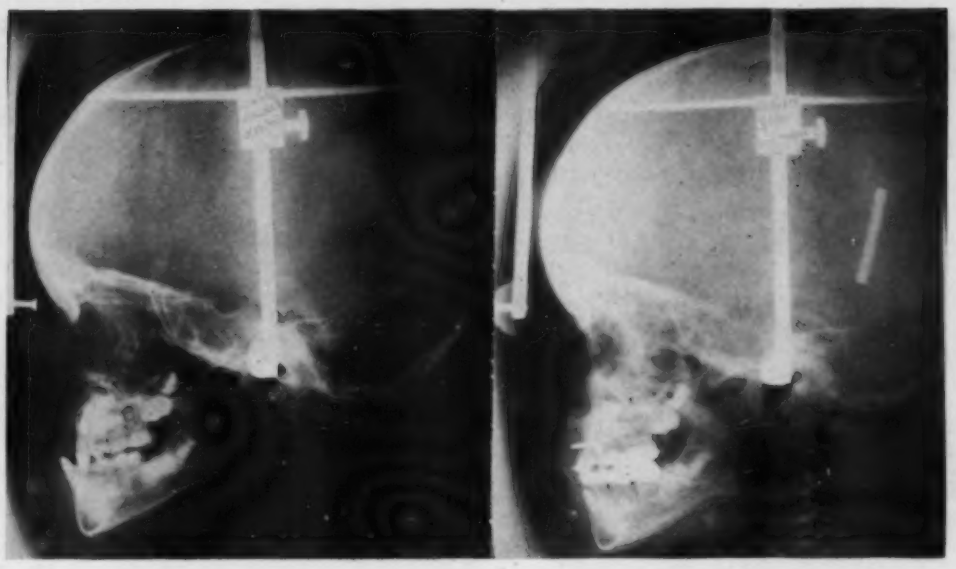


Fig. 22.—Before and after treatment roentgenograms of a 4-year-old girl. Originally an Angle Class III dentofacial deformity. The mandible has a comparatively normal size and gonial angle.

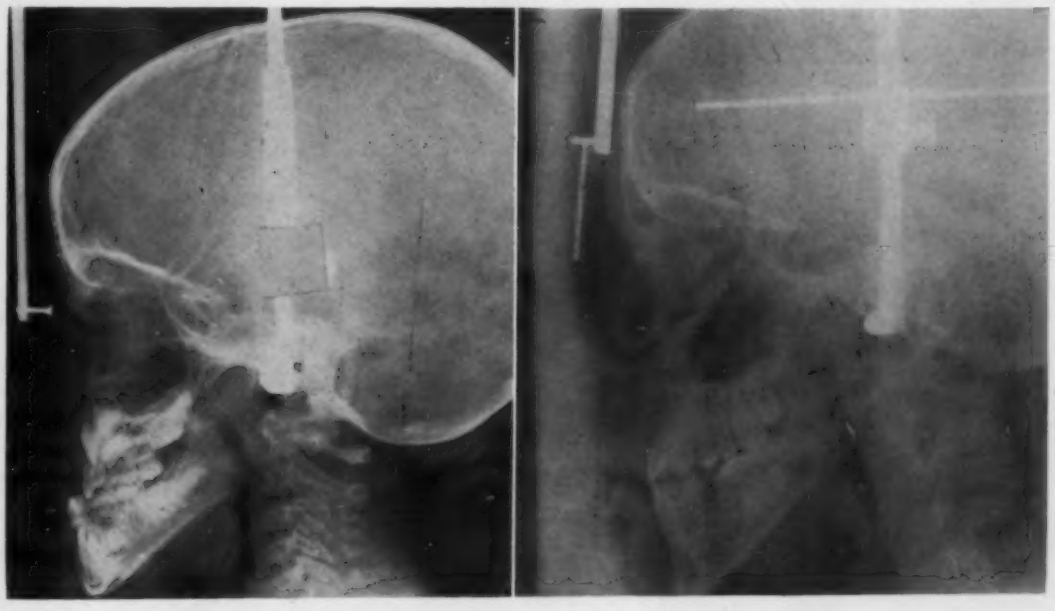


Fig. 23.—Before and after treatment roentgenograms of a 6-year-old boy. Originally an Angle Class III dentofacial deformity. Mandibular body is long compared to the ramus, and the gonial angle is obtuse.

SUMMARY

The question was posed whether diagnosis should involve the determination of all that is wrong in a given deformity. Three handicaps were cited that might limit or confuse this determination, namely:

a. Perpetuation of the term malocclusion to designate all types of dental and facial deformities.

b. Use of a classification to designate a complete case analysis.

c. Disagreement as to what constitutes the normal in dentofacial relationships.

Regardless of the treatment possibilities, it is necessary to know all that is wrong in a given deformity in order to make a reasonable prognosis.

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RADIOGRAPHIC ANALYSIS

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IT HAS been repeatedly pointed out that he who understands the normal deviations can recognize the abnormalities which occur in the dental radiographic films. In the latitude of this subject of radiographic analysis, there appears to be greater need for the analysis of techniques employed in producing dental films than in interpretations, for, basically, there are two gross entities which are easily recognized. They are: (1) radiolucent areas and (2) radiopaque areas. By correlating subjective symptoms of the patient and objective findings with the radiograph, a tentative diagnosis can be deduced, but the differential diagnosis rests squarely on the shoulders of the pathologist. This concept is gradually gaining momentum in the profession to the betterment of fundamental biologic interpretation.

A classical example of this concept is the cementoma as illustrated in Fig. 1. Here a radiolucent area is recognized at the onset in the young patient, usually occurring around the apices of the lower anterior teeth.

The radiologist, without subjective symptoms and objective findings, can very easily read into this radiograph periapical pathology due to such etiological factors as trauma and infection. Yet, when he tests the vitality of these teeth and finds them vital, and when he percusses these teeth and finds that there is no differential response in the percussion note, and when he observes that there are no color changes in these teeth, he is ready to reconsider his diagnosis, and advisedly recommends biopsies in place of wholesale extractions. The pathologist is very much in the same position as the radiologist. He too must have the subjective symptoms, the objective findings, and the radiographs before he completes the diagnosis.

As this concept of radiographic interpretation is being accepted more widely, it is natural that dentists are turning their interest to the problem of taking uniformly perfect pictures. With the orthodontist the problem of securing uniformly perfect radiographic results has always been present. There is no more difficult task than securing interpretative radiographs in a mouth in which the teeth are out of alignment, malposed, and in the process of exfoliation. Yet this is an everyday task for the orthodontist, and his radiographs must be of such quality that he is not ashamed to present them to any oral surgeon or restorative dentist.

Further impetus has been added to the demand for uniformly perfect radiographs by the request of the Veterans Administration for restorative dentistry

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authorizations. In the clamor for "quicky" refresher courses on radiographic technique, several interesting sidelights have come into focus.

First, there has been research done in the field of dental radiology which has not been publicized although published.

Second, the manufacturers of dental radiographic equipment have accepted the advances made by those doing research in dentistry not because it increases their profits but because the research is fundamentally sound.

And third, the dental profession has accepted the fruits of the men in research because they have recognized their failures and are amenable to a change for the better.

Consider, then, some of the changes that have taken place in the machine used to produce the x-ray. Styling and flexibility have been contributions of the manufacturer; but what about the increase in target-film distance and the use of double diaphragms? These contributions have come from men of research in dentistry.

Three decades ago, McCormick on the west coast introduced the advantages of increasing the target-film distance with long cones and a double diaphragm. The question is rightly asked, "Why did not this idea take ahold and become a routine procedure in the dental office?" The answer is the lack of provision for space in setting up dental offices for this technique. Likewise, this technique requires finesse and accuracy. A professor of a leading dental school once remarked: "There is nothing to this business of dental radiography. All you have to do is set the machine at a given angle, insert the film and press the button."

Simple as this sounds, the practitioner has learned that there is more to be sought after and that there are fallacies in this statement.

To understand the advantages of increasing the target-film distance, one must appreciate some of the electrophysics fundamental to the production of the x-ray. By definition, the x-ray is a form of radiation which emanates from a highly exhausted vacuum tube when an electric current of high potential is passed through it. This is schematically illustrated in Fig. 2.

When the master switch on the machine is turned on, a current of four to twelve volts passes through the filament. As the filament becomes heated, electrons pass from the filament into the space surrounding it. When the timer switch is activated, a high potential current drives these electrons against the target. This stream of electrons against the target is called the cathode stream. As these electrons hit the target, they are reflected as a secondary form of radiation. This secondary form is called x-radiation. Inasmuch as all these electrons are of different masses and are striking the target at different velocities, the x-rays which are produced have different wave lengths and form the x-ray spectrum.

This beam of x-rays having varying wave lengths has a varying penetration. The shorter the wave length the more penetrating the ray. It is the "hard" penetrating ray of shorter wave length that is desired in dental radiography. While the vibrating ray is drawn schematically in Fig. 2, it is interesting to note that in the x-ray spectrum running from the soft rays to the hard rays

there are from two hundred fifty million to three thousand trillion vibrations per inch. The soft rays of greater wave lengths sometimes called the Grenz ray do not penetrate the tissue rapidly, and the resultant radiograph is soft and diffuse.

Fig. 1.

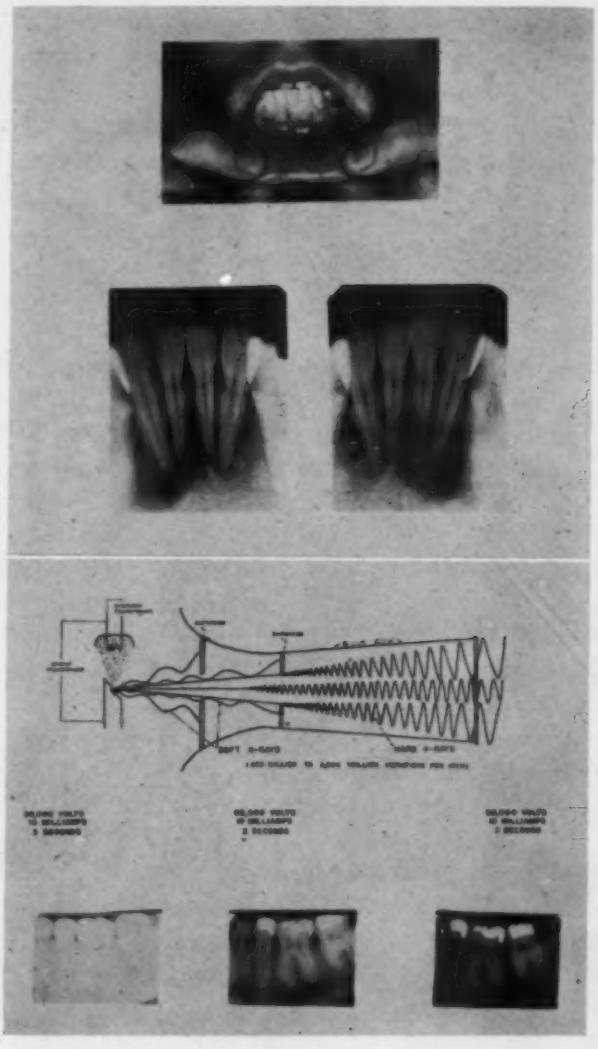


Fig. 2.

The radiographs shown in Fig. 2 demonstrate the penetration of the soft and hard rays. In all three films the exposure time is constant (3 seconds), and the quantity of electrons emanating from the filament is constant (10 milliamperes). The potential which drives the electrons against the target has been varied from 35,000 volts to 95,000 volts. These films were exposed by a General Electric D3 type of machine which has a kilovoltage control. Note the difference in density produced by the soft radiation of 35,000 volts as compared to the hard radiation of 95,000 volts. By varying exposure time or milliamperage, similar results can be produced. Standard dental equipment is set to operate

at 65,000 volts and 10 milliamperes. Change in exposure time is the only variable which the dentist controls. But in commercial dental x-ray machines, both soft rays and hard rays are being emitted. These soft rays can be eliminated in two ways: (1) by increasing the length of the cone and (2) by using a double diaphragm to inhibit soft stray radiation emanating from parts of the target other than the focal spot.

It might seem that the double diaphragm would accomplish the desired result without the long cone. This would be true if the film could be placed in contact at all times with the object to be radiographed. Unfortunately, the factor of adumbration (area overshadowing) and magnification occurs when the film is not in contact with the object. This point of adumbration and magnification is illustrated in Fig. 3.

Here two films in contact with a screen are radiographed, one with a long cone and one with a short cone. (Both cones have double diaphragms.) This procedure is duplicated with the difference that the screen is two inches away from the film. Note that in the radiograph produced by the long cone there is less adumbration than in the radiograph produced by the short cone, but the magnification is approximately the same. This factor of adumbration enters into dental radiography and is compensated for by the use of a longer cone. Adumbration is manifest in the dental radiograph as diffusion of detail. This is demonstrated in Fig. 4.

The technique by which these two radiographs were prepared is illustrated on the left. Note the clarity of detail in the film taken with the long cone. Both radiographs are readable but there is a difference in the quality. The questions that immediately arise are: "What is the correct length of the cone, and where do you get it?" To the first question the answer is that the distance from the target of the x-ray machine to the end of the cone should be at least twelve inches. Cones of this type are called "sinus cones." They were made originally for the ear, nose, and throat specialists and were designed primarily for taking pictures of the mastoid processes. They are stock items that fit dental units and are available through regular dental supply depots. (Fig. 5.)

Fig. 5 is an illustration of three x-ray machines with the conventional standard dental point and the adaptation of the sinus cones to these same units. These stock sinus cones come equipped with the secondary diaphragm, and are ready for use simply by replacement. For those who possess machines other than these mentioned, it is possible to secure the sinus cones from the Rocky Mountain Metal Products Company in Denver, Colorado. Send to this firm the name of your machine, model, and specify that you want a *sinus cone*. These are turned from aluminum, are light, and require no counterbalancing of the x-ray machine head.

With the use of the sinus cone it is not necessary to change the output of the unit as it comes from the manufacturer. The machine is still operated on 110 volts and 10 milliamperes. In use of cones of greater length as advocated by Fitzgerald from the University of California, it is necessary to increase the milliamperage and decrease the voltage. This change should be made by a factory representative and should not be attempted by anyone who is not completely familiar with the hookup within the control cabinet.

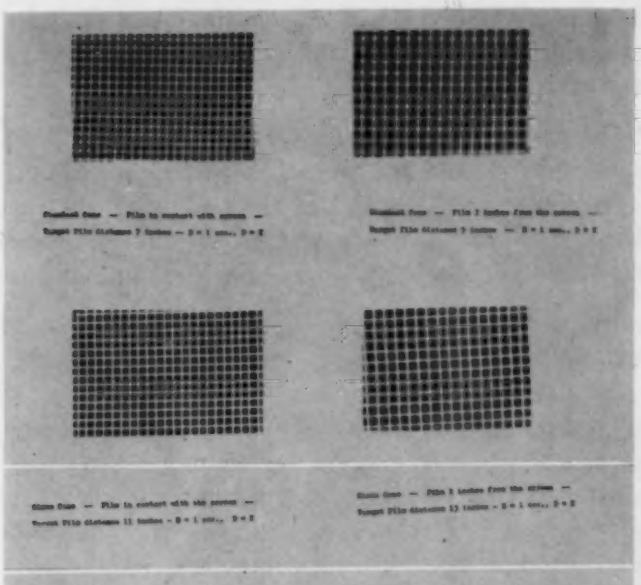


Fig. 3.

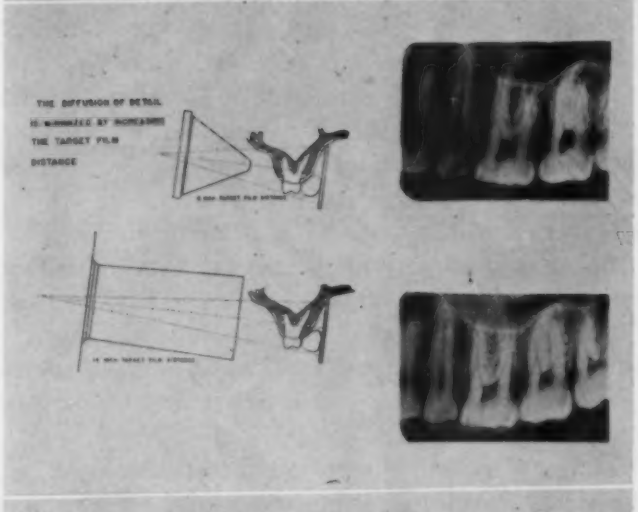


Fig. 4.

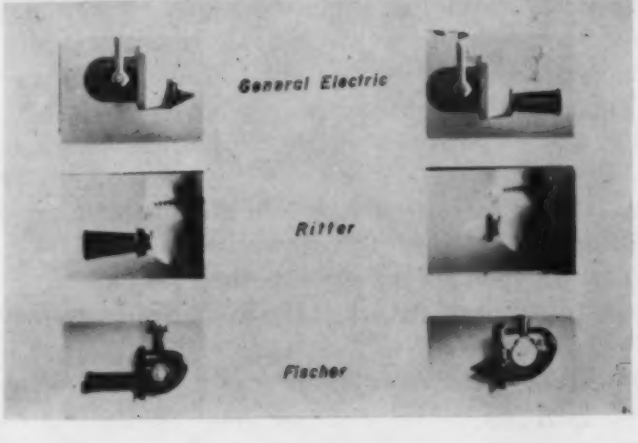


Fig. 5.

In analyzing the technique for producing uniformly perfect dental films, one finds that there are fundamentally two procedures designed to compensate for the anatomical variations encountered in dental radiography.

Briefly these two techniques are:

1. *The bisecting angle technique* wherein the film is placed against the lingual mucosa and the beam is set at right angles to an imaginary line bisecting the long axis of the teeth and the plane of the film.
2. *The paralleling technique* wherein the film is placed parallel to the long axis of the teeth and the beam is set at right angles to the film.

Paradoxically, dentists seek to reproduce in the radiograph the teeth for minute examination for pathology and accept the teeth as the prima facie for pathology of the surrounding investing tissue. Clinically, this condition is fallacious in only the rare minority of pathologies that occur in the oral cavity.

For this reason, the bisecting angle technique has been accepted and is still of value diagnostically for certain areas of the oral cavity. Conversely, the bisecting angle technique is of little value in the postmandibular areas, whereas the paralleling technique is definitely advantageous.

The paralleling technique is not new. Many operators have been using it and did not realize that they were. It is based on the premise that the film is propped in the mouth so that it is parallel to the long axis of the teeth. Numerous devices have been used such as bite blocks, cotton rolls, and film holders. To illustrate the paralleling technique, Fig. 6 is presented.

In the postmandibular area, it is not difficult to place a film which will be parallel to the long axis of the tooth without using any props. As the patient holds the film, the cone is so positioned that the face of the cone is parallel to the film. Three very important advantages are gained in this technique: (1) the contact points are aligned to avoid overlapping; (2) there is no necessity to use the readings from the angulometer on the head axis of the machine; (3) the time-old adage that the plane of occlusion must be parallel with the floor becomes a heresy.

It is interesting to note that some manufacturers provide a sinus cone to which the conventional dental point can be inserted. Why the pointed cone was ever foisted onto the profession is a complete mystery. Originally, the dental x-ray machines came equipped with a short cone (sometimes called a horn). Later, models appeared on the market with a pointed cone. No doubt this was an appeal to the esthetic sense, for it never made the bisecting angle technique any simpler and definitely is a distraction for the paralleling technique. Some dental radiologists claim that the pointed cone permits the placing of the machine closer to the patient's face, which is not an advantage and even if it were could be compensated for by changing the exposure time.

The lower anterior teeth have presented a problem in dental radiography when attempted with the regular No. 1 dental film. There has been on the market a narrow film which is one and five-eighths inches long and three-fourths inch wide. This film in a rubber packet is made by the General Electric Company and is called Bolin Narrow Lightening Film. A film of similar size is made by the Eastman Kodak Company in a paper packet in ultraspeed.

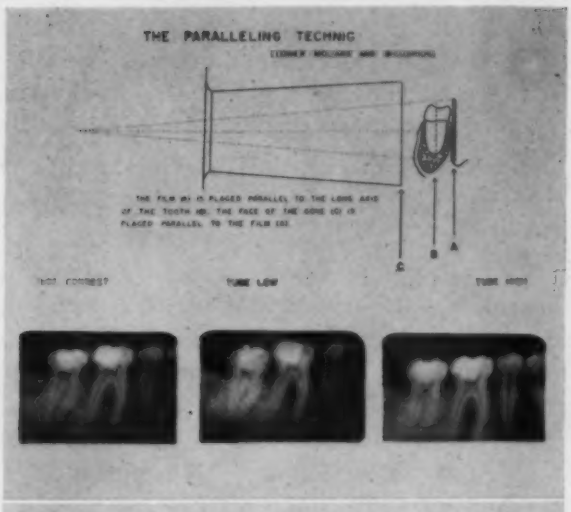


Fig. 6.

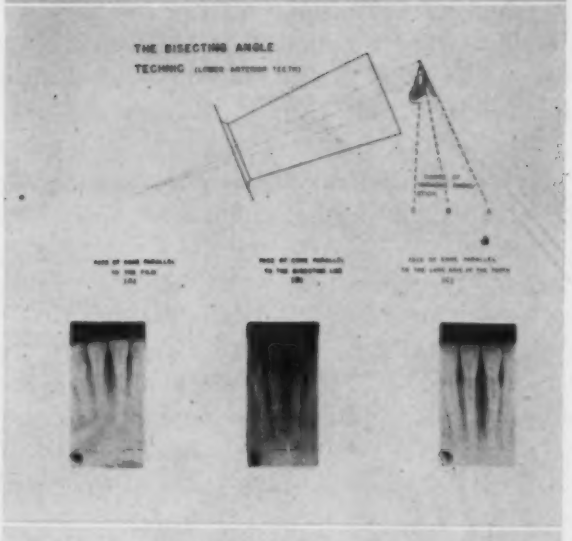


Fig. 7.

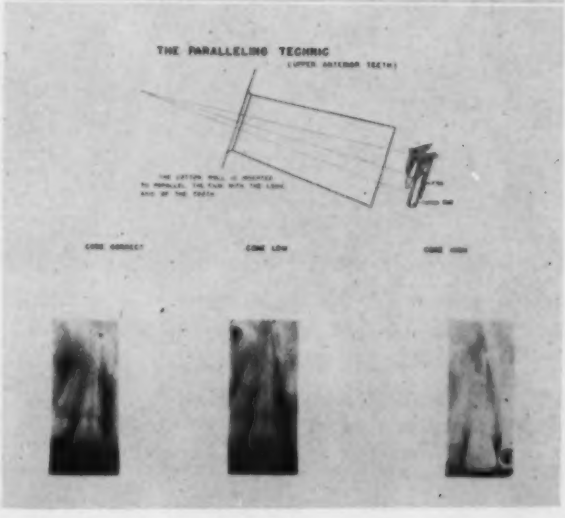


Fig. 8.

This narrow film has the distinct advantage in the lower anterior teeth that it can be positioned without being curved or bent. Anytime that a film is bent, distortion takes place. In the majority of instances, the lower teeth cannot be radiographed on the conventional size No. 1 film without either bending the film or using props to place the film away from the curvature of the mandible.

The narrow film, when used with the bisecting angle technique, affords an opportunity to prepare readable films as illustrated in Fig. 7.

For all that the bisecting angle technique is advocated, it is interesting to note that the angulation normally taken from the machine can be discounted. By placing the face of the cone so that it is parallel with the plane of the film, foreshortening takes place. By placing the face of the cone so that it is parallel with the imaginary bisecting plane, a good reproduction is made, but by placing the face of the cone parallel to the long axis of the tooth, elongation takes place. Thus, the range through which one may use the bisecting angle technique is well defined.

Upper anterior teeth present a different anatomical problem because of the heavy lingual bony ridge. For this reason, a modification of the bisecting angle and the paralleling technique is used in the following manner as illustrated in Fig. 8.

First, the film is made more nearly parallel to the long axis of the tooth by propping it out at the incisal edge with cotton rolls. Two rolls held with a rubber binder suffice on narrow films. The rubber binders and cotton rolls are radiolucent.

Second, the face of the cone is placed parallel to the film. Note that in this combined technique the film is not absolutely parallel to the long axis of the tooth but that the angle formed by the planes of the film and the long axis of the tooth is more acute than it would be without the cotton roll props.

This combination of the bisecting angle and paralleling techniques is also used in the molar region as illustrated in Fig. 9.

Up to this point, no mention has been made of the fact that in all radiography of the teeth the nearly parallel bundle of x-rays should pass through the contact points unobstructed to avoid overlapping. With the paralleling technique, overlapping of the contacts is not likely to take place; however, the upper molars do offer another problem because the mesial surfaces of the upper molars incline distally on the lingual surface. This anatomical deviation is frequently slighted and overlooked because when the head is placed in the customary position with the plane of occlusion parallel to the floor, it is difficult to study the relationship of the contact points. With the head tilted back it is possible to study the relationship of the contact points even after the film is in position, and overlapping can be avoided. With the concept of a beam of radiation superseding the old concept of a central ray, one can readily see the advantages of tilting the patient's head back for a clear vision of paralleling the face of the cone to the plane of the film so that the bundle of x-rays passes through the contact points unobstructed.

The zygomatic process has for a long period of time been considered a bugaboo in radiology of upper molars. When a technique is used wherein the

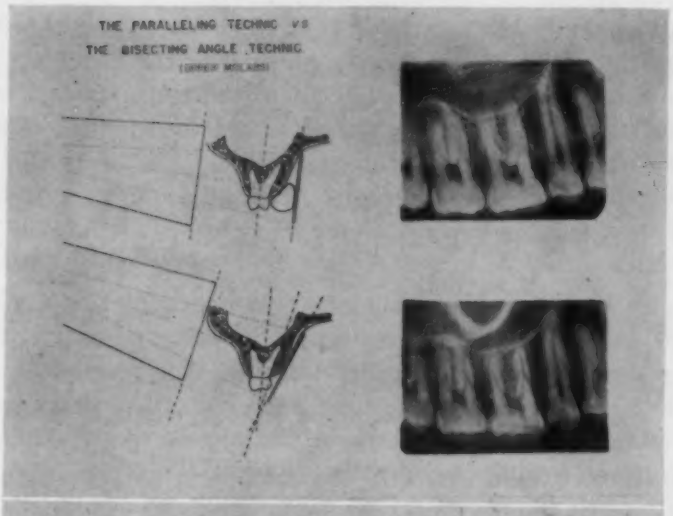


Fig. 9.

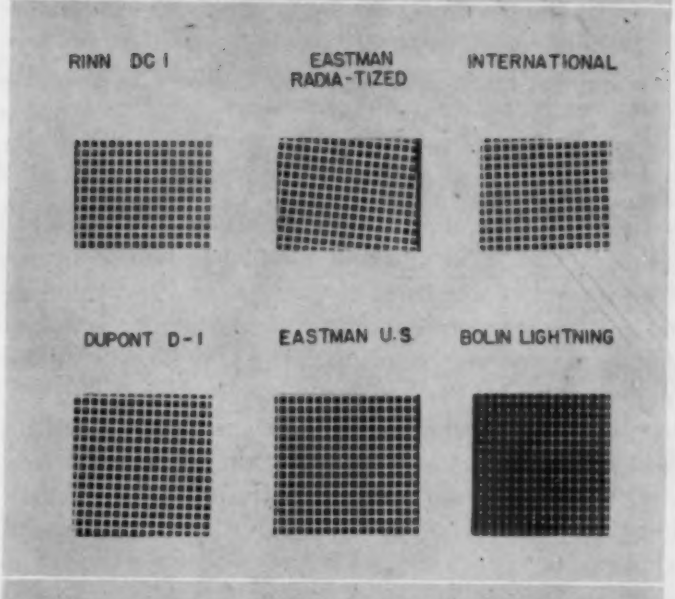


Fig. 10.

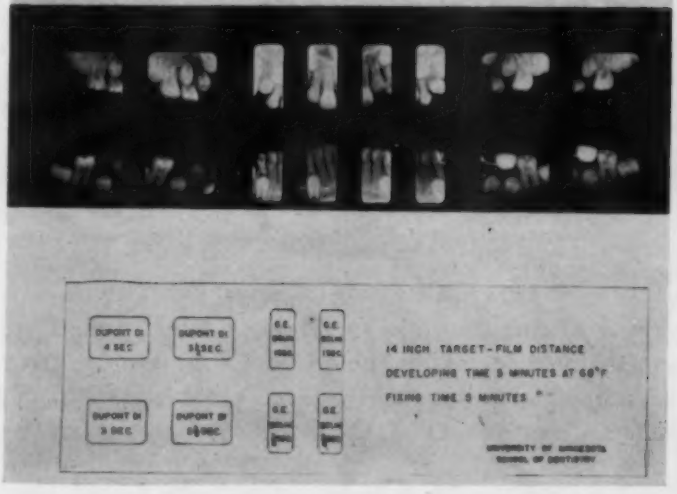


Fig. 11.

radiologist cannot study the relationship of the contact points to the film as in the case where the plane of occlusion is parallel to the floor, wherein the radiologist imagines a bisecting plane adjacent to the teeth which have three roots in a direction similar to the legs of a tripod, or one where in the radiologist places a pointed cone on an imaginary spot on the face inferior to the corner of the eye, it is no wonder that the radiographs produced are more a product of chance than skill. The zygomatic process, though an obstacle, is not the cause of poor upper molar films.

With the orthodontist the problems of radiography are multifold because of anatomical malpositions of the teeth; yet he is supposed to produce perfect films. In the case of overlapped contact points, it is possible to open contacts with special techniques, but there are some fundamentals which are precepts for good dental radiography other than special techniques.

First, position the film correctly so that it is not curved or bent and is as nearly parallel to the long axis of the teeth as possible. (This is accomplished by using film holders or cotton rolls.)

Second, position the machine so that the face of the cone is parallel to the film.

Third, expose the film for the correct length of time and develop for proper density.

Exposure time is dependent upon the film and all types are manufactured ranging from slow to fast. The speed of the film is dependent upon the fineness of the particles of reactive agents in the emulsion. The trend today is toward the use of fast film which does cut down on the length of exposure. For the young orthodontic patient or the adult patient, it is more pleasant to get the process of "picture taking" over with as quickly as possible. At the onset of the manufacture of the fast film, many radiologists condemned it because it was grainy, but with the refinements of manufacture this is not a problem in dental radiography. It is true that the range of latitude for carelessness with fast film is markedly less than with slow film. Exposure times and developing times must be correct and accurate.

To illustrate this point, observe in Fig. 10 the differences in intensity of the Rinn, Eastman Radiatized, International, Dupont, Eastman Ultra Speed, and Bolin Lightning films. All of these films were exposed for one-half second and all were developed at 68° F. for five minutes. The Bolin Lightening, Eastman Ultra Speed, and Dupont D1 are fast films and are preferred to the exclusion of the others where a sinus cone is used. The other slower films can be used, but with the increased target-film distance established by the sinus cone, the exposure time becomes so great that it is not practical because the patient may become fatigued and move the film during exposure.

The exposure time used routinely is tabled in Fig. 11.

The two types of film used are the DuPont DI and the Bolin Lightening. The convenient manner in which the Dupont film can be unwrapped in the darkroom is a distinct advantage where large numbers of films are being processed daily. The rubber packet of the Bolin Lightening film is soft and well

tolerated by the tissue. The age of the patient in Fig. 11 is 9 years. The exposure time is as follows:

	NO. OF SECONDS
Upper molars	4
Upper premolars	3½
Upper cuspids	1
Upper lateral and central incisors	1
Lower molars	3
Lower premolars	2½
Lower cuspids	¾
Lower lateral and central incisors	¾

The marked difference in exposure time between the anterior teeth and the posterior teeth is due to the film speeds, Bolin Lightening being the fastest film available for dental radiology. These exposure times may not be satisfactory in other locations, and a set of exposure times should be developed by trial and error for every machine. The reasons for this are many, including such factors as line voltage, machine output, and the individual fancy of the operator. Some radiologists define a good radiograph as one in which the mucosa is visible; others prefer the hard contrasting black and white films as illustrated in Fig. 11.

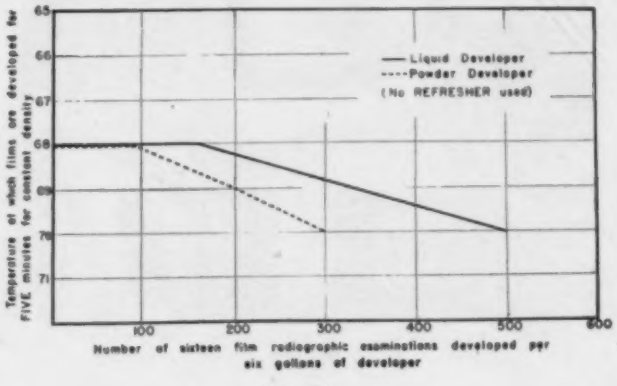


Fig. 12.

In the darkroom procedures, some remarkable advances have been made by the manufacturers. Consider first the developing solutions and liquid concentrates that are on the market. It may be assumed that the only difference between the liquid concentrates and the powder chemicals is that the liquid concentrates are a "factory mix." Such is not the case, for there have been chemical changes which are factory trade secrets. One of the advantages of liquid concentrates is that it has a fixed life whereas with the powder style chemicals the life gradually wears out. A second advantage of the liquid concentrate type of developing solutions is that it has a greater length of activity. All developing and fixing solutions will react with a given area of film. In Fig. 12 the actual length of activity is compared.

The liquid concentrates used in this record in six gallon tanks actually developed approximately 38 per cent more film than the powders. In this record it is to be further noticed that at no time did the temperature within the tanks exceed 70° F. This temperature is maintained by refrigeration controls. It has been an accepted fact that summer temperature above 76° F. damages the hydroquinine in developing solutions especially with powder types of chemicals. Extreme cold has no effect. With the liquid concentrates, temperatures above 76° F. are not as deleterious, although prolonged use at high temperatures is not advised. For practical purposes in dental offices which do not have refrigeration, the liquid concentrates can be used for longer periods during the summer months.

Another experiment has revealed that the temperature changes with the liquid concentrates do not produce the marked changes in density that have been noted in the powder type of chemicals. Fig. 13 consists of five radiographs all exposed the same length of time but developed at different temperatures.

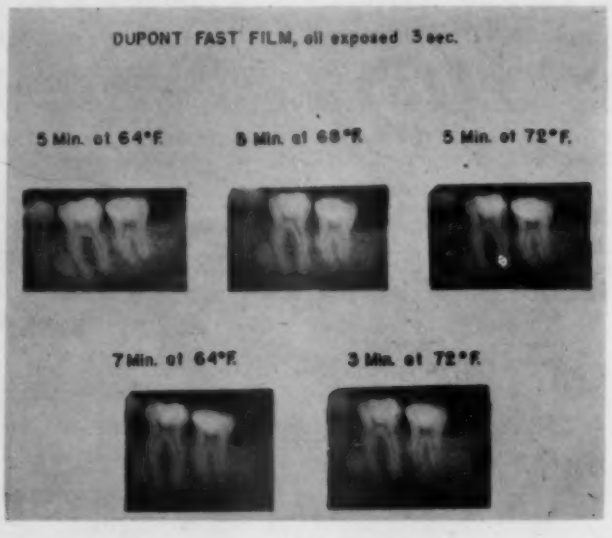


Fig. 13.

The procedure advocated is to develop at 68° F. for five minutes, stop bath one minute, fix for five minutes, and wash for ten minutes in cold running water. The result obtained by this procedure is shown in the center picture. Note the little difference in density in the pictures with a range of developing temperatures from 64° F. to 72° F. where the time is constant (five minutes). Before any developing is started, the temperatures of the solutions should be taken. The accepted procedure is to develop for five minutes at 68° F. However, by varying the developing one minute per 2° change over or under 68° F., uniform density can be maintained. In Fig. 13, note the contrast similarity of the radiograph developed at 64° F. for seven minutes with the radiograph developed at 72° F. for three minutes. In spite of the latitude of carelessness that is afforded by liquid concentrate type of developers, more radiographs are ruined in the darkroom than are ruined by faulty film and machine position.

There is no compensatory measure which will allow a man to develop in a closet which has a one-half inch light leak under the door; or for the individual who paints a 40-watt bulb with red paint and calls it a safe light; or for the man who uses an old battery case for a developing tank wherein the washing compartment is used for both a stop bath and rinse; or for the individual who leaves his solutions uncovered from one week to the next.

There remains this subject of mounting radiographs. While there are all types of mounts on the market with wide variety of costs, the mount which has open windows is preferred to translucent acetate, celluloid, and plastic mounts. While it is true that the films in the open-window type of mount such as the "Ezeemount" manufactured by Rinn of Chicago are subject to fingerprinting and damage, the fact remains that translucent acetate, celluloid, and plastic types of mounts filter light and inhibit the intensity of the radiographs that one has taken such care to produce.

The single surface emulsion film of former years necessitated the mounting of films in reverse with the emulsion toward a translucent type of mount. In spite of the refinements in film manufacture, films are still being mounted in reverse; that is, the dentist still views his radiographs from behind the patient. This is awkward for routine charting purposes, and for the orthodontist who works up his case from casts it necessitates mental gymnastics. This matter came up for discussion in the radiology section of the American Association for Dental Schools in Chicago last June, and it was found that some schools are still teaching the reversed procedure of mounting.

The number of films that should be taken for a complete examination is a matter of judgment. The size of the mouth and the size of the film are the two factors which must be balanced. The "O" gauge film in small mouths is a very convenient film to handle. All too frequently the number of windows in the mount predetermines what constitutes a full-mouth radiographic examination.

Once the orthodontist has secured a full-mouth radiographic examination, it is not unusual to find that additional film exposed at varying angles will be of distinct aid in establishing a diagnosis and servicing a treatment.

In summarizing this presentation, there are but two points which should be re-emphasized:

1. The radiograph is only an adjunct in diagnosis and treatment planning.
2. The quality of the radiographs depends upon the ingenuity and the finesse of the operator.

With the cooperative research projects of the manufacturers and the dental profession, what may seem like the antithesis today will soon be passé. The profession is still awaiting the panoramic full-mouth radiographic examination taken on one film at one exposure and without capitulating procedures for anatomical variations.

REMARKS ON THE PRESENTATION OF THE ALBERT H. KETCHAM MEMORIAL AWARD, 1948, BY OLIVER WILSON WHITE

Mr. President and Members of the American Association of Orthodontists:

Someone once said that ideas must be incorporated in persons before they can effectively move mankind. The development of the specialty of orthodontics is the result of an idea incorporated in many persons. We recognize the futility of attempting to list the many leaders in orthodontics whose personal sacrifice and tireless energy are responsible for the progress we have known.

Out of the number, however, we find one person in whom the idea took special root. Dr. Albert H. Ketcham was probably the most effective force in spreading basic knowledge of the science of orthodontics. With Dr. Ketcham the advancement of orthodontic science was more than an idea; it was a compelling life motive. It was fitting, therefore, that at his death the members of our profession should seek to perpetuate his memory, not alone in ephemeral phrases of eulogy, but in continuing tribute. That tribute took shape in the Albert H. Ketcham Memorial Award, established to recognize in his memory those of our number who make outstanding and meritorious contribution to the science of orthodontics.

I regard it as a distinct honor that I am permitted to present the Albert H. Ketcham Memorial Award to a colleague who is eminently deserving of this recognition. To Dr. Clinton Chappell Howard goes not only this certificate of merit, but the gratitude of his colleagues for his devotion to his profession and his contributions to the progress of the science of orthodontics.

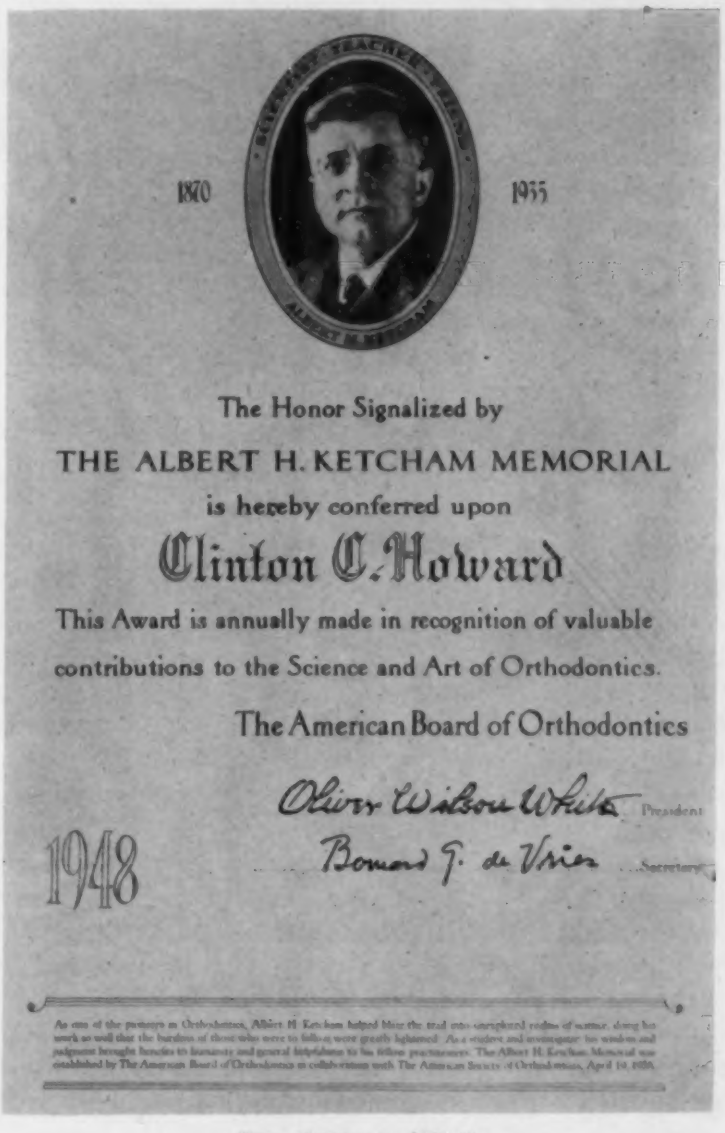
When Dr. Howard as a young man acted contrary to the wishes of his family in breaking away from a medical training, the medical profession lost a potential leader, and orthodontics gained one of its outstanding leaders. Ever since Dr. Howard's graduation from the Dental Department of the University of Southern California in 1907, he has played a prominent role in dentistry and in orthodontics. When he retired in 1942, he had rounded out thirty-five years of active devotion to his profession.

It is difficult to measure adequately the inspiration Dr. Howard's life holds for the younger practitioners, and indeed for young men in any occupation. The trend of the age has been to shorten a man's productive years, to provide security for the inevitable twilight hours. In a social sense, this is a commendable objective, but when we see the tremendous amount of good accomplished by a man like Dr. Howard during a period when most men would have been in retirement, we are led to wonder if humanity is not losing something fine when it compels or persuades its elder citizens to curtail their productivity.

Productivity has been the keynote of Dr. Howard's career. He began writing when he first entered the profession, and throughout his years of practice

Presented at the Forty-fourth Annual Meeting of the American Association of Orthodontists, Columbus, Ohio, April 26-29, 1948.

he remained a regular contributor to orthodontic literature. As a member of the staff of the Good Samaritan Clinic in Atlanta, Georgia, he made many valuable contributions to dental literature, and his study of acromegaloid growth resulted in the acceptance of what we know today as the Howard syndrome.


1870
1955
The Honor Signalized by
THE ALBERT H. KETCHAM MEMORIAL
is hereby conferred upon
Clinton C. Howard
This Award is annually made in recognition of valuable
contributions to the Science and Art of Orthodontics.
The American Board of Orthodontics
Oliver Wilson White President
Howard J. de Vries Secretary
1948

THE KETCHAM AWARD

I would like at this point to quote a statement made by Dr. H. C. Pollock, Editor of the AMERICAN JOURNAL OF ORTHODONTICS, for it indicates the interest Dr. Howard's publications created, not only in orthodontics, but allied health professions as well: "Personally, I am very happy that Dr. Howard is to receive the Ketcham Award. This JOURNAL has had more requests from the medical profession for his writings than any other orthodontic author. No doubt this

is because of the tie-in of the Howard syndrome with certain other diseases." Dr. Howard has held many high offices in the profession, and his leadership has been responsible for many outstanding reforms in dental education. The efforts of Dr. Howard and his fellow workers resulted in the establishment of the Council on Dental Education of the American Dental Association and the subsequent movements which have been so far-reaching in educational reforms.

It is difficult if not impossible to evaluate his work, his amiable character, his earnest devotion to duty, and the hearty interest he has always manifested in the dental welfare of the American people. These are qualities for which there can be no equivalent return, except in the eternal glory of that world where gratitude is spontaneous, and where we shall know what we owe to those who have variously served us.

Dr. Howard, we ask you to accept this award, not as a reward for your services, for you find that in the approbation of your own conscience, but as a memento of our appreciation of them.

RESPONSE BY CLINTON CHAPPELL HOWARD TO THE PRESENTATION OF THE ALBERT H. KETCHAM MEMORIAL AWARD

Mr. President, Chairman White, Ladies, Gentlemen, and Members of the American Association of Orthodontists:

I accept this honor in a dual attitude. You have seen fit to place beautiful flowers upon the living which prompts a gratitude within the soul. No doubt you have aroused as well as kindled the ambition of the younger men to seek this distinction. The requisite is the possession of a vision, prompted by observation, and an unremitting energy to make the vision a reality.

The second appreciative attitude is my recollections of the man who had the foresight to create the American Board of Orthodontics, whose mission is the recognition of merit, and it was my privilege to discuss the possibility of such a Board with Albert Ketcham. I was one of the first to seek the certificate and it was sent to me by Dr. Ketcham. I remember Ketch (as I affectionately called him) as a man unusual in qualities of observation. He possessed the zenith of meticulous technical attributes. And, it must be added, his heart was sympathetic and generous toward his fellow man.

I was requested to record in this response just what were the circumstances which led me into the path of correlative investigation. I shall do so briefly. During some ten years of active practice in accord with the accepted orthodontic concept, I was confronted with unmistakable evidence to the effect that our etiologic argumentations were entirely sophomoric if applied to biologic principles. To illustrate, we were taught that the mouth breathing individual would grow into a Class II, Division 1 malocclusion. It was explained how enlarged faucal tonsils caused an overgrowth of the mandible. We were told that mechanical stimulation would "grow bone." We accepted the hypothesis that mechanics was the controlling factor over and above the principles of biologic

laws. One of our worst doctrines was "growth is a smooth and continuous process" to be attacked with mechanical therapy at any age. We were led to believe that each individual was born to reach his inherited possibilities. These fallacies and more besides excited my curiosity.

CLINTON CHAPPEL HOWARD

I had frequently discussed such matters with a medical friend whose curiosity was centered upon the possible effect the hormones had upon the physical and mental economy of man. He interested five wealthy philanthropists and after midnight on a night in 1922, he phoned me to say the clinic was underwritten and that I was appointed secretary of the medical staff. There were thirty-two well-trained members, each representing some special field or area of the total physical make-up. My role was to place in the physical record of each case a survey of the oral cavity as well as the orthodontic aspect of that particular individual. There were nine departments. One department, which was conducted by the professor of roentgenology of the medical school, made a routine of x-raying the hand bones to determine the growth status of the osteo-

logic process in its physiologic relationship to the chronologic age. It seemed a fertile field as applied to the orthodontic routine of examination. I went to nine public schools and x-rayed the hand bones of twelve hundred children; this was in addition to some four thousand five hundred radiograms taken at the Good Samaritan Clinic. It taught much, and particularly so in the better grasping of the "Law of Variation." The overgrowth of the mandible was also an interesting study as contrasted with the undergrown mandible. My interest in orthodontics was sharpened by what I consider a broader viewpoint of the etiologic and diagnostic acumen in our field.

Much more could be said. The published records, however, will constitute the highest and the best evidence. You have seen fit to bestow upon me the greatest honor within your providence. You have by this act placed my name upon the scroll of those who have been accepted by this organization as contributors toward the advancement of the orthodontic specialty.

As the capstone to my professional career, my appreciation is boundless, and I wish to thank you from the depth of my heart.

Reports

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

Your Committee has carefully studied President Earl G. Jones's address, and we are pleased to submit the following comments concerning a number of recommendations and suggestions contained therein:

Our President suggests that the sectional societies might spend part of the time at meetings in giving refresher courses and establishing study clubs. We feel that refresher courses of maximum value can properly be presented only in well-equipped dental schools, and that usually these courses will require more time than is available at section meetings. We believe, however, that the section officers should encourage and assist in the formation and conduct of study clubs in local communities of each section. Small groups of our members may derive much satisfaction and profit in cooperative studies of their various problems and in developing personal friendships.

We heartily endorse the idea that the Committee on Orthodontic Education prepare an educational program for both undergraduate and graduate students and that this program be presented to the Educational Council of the American Dental Association for their information and guidance.

We approve the President's remarks complimentary to the activities and achievements of the American Board of Orthodontics. Many candidates for certificates of the Board have stated that the preparation of the material necessary to satisfy the requirements of the Board constituted their first inspiration to study since graduating from their dental schools. They are justly proud of their recognition by the Board.

We join President Jones in being proud of the AMERICAN JOURNAL OF ORTHODONTICS. Finally, we have a journal devoted exclusively to orthodontics and allied subjects, its character is beyond criticism by any other organization. We genuinely appreciate the many years of faithful and capable service of our editor, Dr. H. C. Pollock, and the splendid cooperation of The C. V. Mosby Company.

The matter of investigating the requirements for admission to membership in sectional societies is important, and similar rules should apply in all cases.

President Jones's remarks concerning the office of secretary-treasurer are timely. While we do not believe that an executive secretary-treasurer is needed at this time, we suggest that our officers and the Budget Committee give serious thought to the idea of furnishing our Secretary-Treasurer with a sufficient fund annually to pay for whatever additional assistance he may require to conduct the affairs of his office properly.

We are in favor of having exhibits of equipment and materials at our annual meetings by manufacturers and dealers whose products are not disapproved by the Council on Dental Therapeutics of the American Dental Association. As stated by President Jones, revenue from these exhibits should be paid into our treasury. Adequate funds should be provided in our budget for all necessary expenses incident to annual meetings.

Your Committee approved President Jones's endorsement of the plan to have a Nominating Committee with a representative from each section prepare a slate of candidates for election to office.

Respectfully submitted,
BEN L. REESE,
ANDREW F. JACKSON,
CHARLES R. BAKER, Chairman.

Presented at the Forty-fourth Annual Meeting of the American Association of Orthodontists, Columbus, Ohio, April 26-29, 1948.

REPORT OF THE NECROLOGY COMMITTEE FOR 1948

In obedience to the unescapable laws of life, again the Great Master has entered the ranks of our membership since our last meeting and removed from among us some of our most beloved and distinguished members. It is the purpose and duty of your Necrology Committee to report at each meeting, with reverence and sympathy, the names and something of the lives of those who have crossed the Great Divide.

Since the meeting at Colorado Springs, it is our painful duty to report the passing of the following members:

Dr. Milo Hellman, Far Rockaway, N. Y.
Dr. Frederic T. Murlless, Jr., Hartford, Conn.
Dr. Burt Abell, Dowagiac, Mich.
Dr. Oscar Carrabine, New York City, N. Y.
Dr. Irving Martin Halperin, Teaneck, N. J.
Dr. Wilbur T. Cate, Fort Smith, Ark.
Dr. Wm. Jackson Childs, Columbia, Ga.
Dr. W. J. Len, Vancouver, B. C., Canada
Dr. Manly Bowles, Winnipeg, Manitoba, Canada
Dr. Bryan J. McGinnis, Beaumont, Texas
Dr. James F. Spencer, Grand Rapids, Mich.
Dr. George F. Burke, Detroit, Mich.
Dr. Charles Henry Juvet, Ottawa, Canada

Outstanding among those on this list appears the name of Dr. Milo Hellman. His researches in unexplored fields were so outstanding in quality and massive in production as to have exercised profound influence in directing the growth and progress of orthodontics through some of the most critical stages of orthodontic development. So invaluable were the efforts of his labors that the Northeastern Society of Orthodontists saw fit to make the program of the November, 1947, meeting of a memorial nature whereby his own sectional society and closest friends could pay suitable tribute to their departed member. The *Milo Hellman Memorial Number* of the AMERICAN JOURNAL OF ORTHODONTICS was prepared almost exclusively by his friends in the Northeastern Society. You are referred to this number, the January issue of our JOURNAL, for the complete notice and obituary concerning this distinguished member and friend.

Through kindness, Dr. Ralph Waldron has assisted the Committee in preparing the report concerning Dr. Frederic T. Murlless, Jr. This report, which Dr. Waldron read at the meeting, appeared in the June, 1948, issue of the JOURNAL.

One of our honored members, and a most distinguished past president, Dr. Burt Abell, passed to his "great reward" since our last meeting, and the Committee has asked Dr. Ernest Bach to read a short biography concerning this greatly beloved brother:

Dr. Abell was a native of Michigan, born near Battle Creek, Sept. 7, 1864. He was reared on a farm and worked his way through school, attending the Battle Creek public schools and Ypsilanti State Normal College. He was graduated from the University of Michigan Dental College in 1892. After practice in Elk Rapids and Albion, Michigan, he pioneered in the field of orthodontics, being graduated in the second class at the Angle School, St. Louis, Missouri.

Locating in Toledo in 1905, Dr. Abell became prominent in the dental field there. His home and office were at 443 West Bancroft Street.

Presented at the Forty-fourth Annual Meeting of the American Association of Orthodontists, Columbus, Ohio, April 27, 1948.

He was president of the Toledo Dental Society in 1908, president of the American Society of Orthodontists in 1923, a founder of the Great Lakes Society of Orthodontists and also president of it, a member of the Kiwanis Club and the Ashland Avenue Baptist Church, and later Sunday School superintendent of the Second Baptist Church and teacher of the men's class.

Among a few of the many virtues which Dr. Abell possessed, I remember most the high ideals from which he never deviated. He was always eager to help those less fortunate, assisting them financially and in other ways to put boys and girls through high school and college. He was known to many a youth as "Uncle Burt."

After practicing in Toledo for thirty-four years until his retirement in 1939, he passed away in St. Cloud, Florida, on April 7, 1947.

Dr. Oscar Carrabine died July 16, 1947, in Larchmont, New York. Dr. Carrabine was born in Nebraska and graduated from Northwestern University in 1898. He married Florence Belford, and to this union was born one daughter. He is survived by his loving wife and the daughter, Mrs. Syrilda C. Helgren. Upon graduation, Dr. Carrabine became instructor in the Orthodontic Clinic at Northwestern University under the guidance of Dr. Edward H. Angle. He practiced orthodontics for over forty years in New York City, and was a lovable and respected gentleman. He was a past grand master of *Delta Sigma Delta*, a member of local and national dental organizations, Mason, a member of the Rotary Club, and the Marmoneck Board of Education.

Dr. Irving Martin Halperin was born Aug. 10, 1905, in Bayonne, New Jersey, and died Feb. 23, 1947. He graduated from Columbia University in 1927 and fulfilled requirements for postgraduate certification in orthodontics at New York University College of Dentistry, where he continued affiliation on the teaching staff. He was a member of local and national dental societies and maintained membership in *Alpha Phi Pi*, and *Alpha Omega* dental fraternities. He was also a member of the Lion's Club at Union City, New Jersey. His career was cut short just as he was reaching his greatest stride in the profession he loved. Dr. Halperin is survived by a devoted wife and three children.

Dr. Wilbur T. Cate, aged 85, of Fort Smith, Arkansas, was found dead in his suite at the Goldman Hotel, where he had lived since closing his home in a fashionable residential area. Dr. Cate maintained his office in the Merchants Bank Building, but would only take care of patients of a long standing. He was at his office the day before his death. He was a native of Springfield, Massachusetts. Survivors are his stepson, Harry P. Daily, Fort Smith attorney, and a daughter-in-law, the widow of his stepson, the late Thomas L. Daily.

On March 24, 1892, William Jackson Childs, one of four children, was born to the late Rev. William Wyatt Childs and the late Melvina Roberts Childs, of Upson County, Georgia.

He received his early education at Joseph E. Johnston Institute in Upson County and then entered the Southern Dental College in Atlanta, Georgia, now Emory University School of Dentistry, where he was graduated in 1916. It was at the old Southern Dental College that Dr. Childs received his enthusiasm for an interest in the science of orthodontics under the brilliant professorship of Dr. Clinton C. Howard.

After graduation, Dr. Childs remained in the general practice of dentistry a number of years before becoming associated with his brother, Dr. Wyatt Bentley Childs, of Macon, Georgia, for the exclusive practice of orthodontics. In 1930 he established an office in Columbus, Georgia, where he enjoyed a busy and successful exclusive orthodontic practice. He was a member and past president of the Fourth, now Western, District Dental Society of Georgia, a member of the Georgia Dental Association and the American Dental Association. He was a member of the Southern Association of Orthodontists and the American Association of Orthodontists.

For a long period of years, Dr. Childs was a leader in organized dentistry. In recognition of his outstanding service to dentistry and the profession at large, the Honorable Fellow Degree of the Georgia Dental Association was conferred upon him in 1945.

It was while attending the meeting of the Southern Society of Orthodontists in Charlotte, North Carolina, that he was stricken. On his return home he was ordered by his physician to the Mayo Clinic, where his condition was diagnosed as carcinoma of the liver. He made a courageous battle for life, but could not be spared. He died in the City Hospital in Columbus, Georgia, on June 13, 1947, and was buried in Park Hill Cemetery. Members of the Western District Dental Society formed an honorary escort.

Dr. Childs was modest and unassuming. To know him was to appreciate his great strength of character. He possessed a charming and an amiable personality, which attracted to him many loyal friends. He was an ardent sportsman—an outstanding golfer and an enthusiastic fisherman and hunter.

Dr. Childs constantly sought to improve his skill, in his enthusiasm for orthodontics. He was devoted to the specialty, and his love for the children under his care prompted him to serve them to the limit of his ability almost to the end.

In addition to his professional leadership, Dr. Childs was prominently identified in many civic activities, the Masonic Order, the Kiwanis Club, and the Executives Club. By religious faith, he was a Baptist.

Survivors are the widow, Mrs. Mamie E. Childs, four daughters, Mrs. Billy Brescia, Mrs. Dan Carter, Mrs. Ed Wolf, and Mrs. Paul Griggs, of Columbus, two brothers, Dr. Wyatt Bentley Childs of Macon, Conrad C. Childs, Yatesville, one sister, Mrs. D. C. Holloway, Thomaston, Georgia, three grandchildren, and several nieces and nephews.

Dr. William James Lea was born in Toronto, Ontario, Oct. 21, 1882. He graduated from the University of Toronto in 1905, passed the examination prescribed by the Council of the College of Dental Surgeons of British Columbia in June, 1908, and was registered as a member of the College on June 15, 1908.

On April 21, 1919, he was elected a member of the Council of the College of Dental Surgeons of British Columbia. In 1919 he was appointed registrar-treasurer of the College of Dental Surgeons of British Columbia, which position he held until the time of his death. In 1929 he was elected a fellow of the International College of Dentists. In 1930 he was appointed the British Columbia representative on the Executive Committee of the Canadian Dental Hygiene Council. In 1932 he received his Certificate from the American Board of Orthodontics as follows: "The Board passed you on your good record in the work performed for orthodontia and dentistry." (This is an excerpt from a letter dated Sept. 13, 1932, and signed by Albert H. Ketcham, President of the American Board of Orthodontics.)

From 1935 to July, 1938, he served as president of the Pacific Coast Dental Conference. Previous to this time he was councillor from British Columbia and also vice-president. He was also a member of the Pacific Coast Society of Orthodontists and the American Association of Orthodontists. He died suddenly on Dec. 20, 1947, on the way to his office.

Dr. Manly Bowles was born in 1872 and died in November, 1946, after a long, beautiful, and useful career. He was a graduate of the Royal College of Dental Surgery in Toronto and was one of the early Angle graduates. His entire professional career was spent in Winnipeg, Manitoba. He was a very versatile man in his chosen specialty. He married May Spink, and to this union two sons were born, one an engineer in Montreal and the other a prominent attorney in Winnipeg. He is survived by his devoted wife, two sons, and four grandchildren. He was a member of the Canadian Dental Society and one of the oldest members of the American Association of Orthodontists. He was a past president of the Manitoba Dental Association and the Winnipeg Dental Society. For many years he was an examiner in orthodontics for the Dominion Dental Councils. He found great relaxation and enjoyment in golf and lawn bowling. He was an active member of the Church of Canada, and a Mason.

Dr. Bryan J. McGinnis was born in 1901 in Wheeling, West Virginia, and died in February, 1947, in Beaumont, Texas. He graduated from the College of Dental Surgery, University of Maryland, and received his special orthodontic training under Dr. Eddie Arnold, of Houston, Texas. He was a member of the local and national dental societies and at one time was an officer of the Southwestern Society of Orthodontists. He was a devoted Catholic. He is survived by two sons. Dr. McGinnis was beloved by all who knew him and his tragic death was a shock to his many friends in our Association.

Dr. James F. Spencer died in Grand Rapids, Michigan, on May 16, 1947. Dr. Spencer was born in Grand Rapids on Sept. 8, 1891. He was educated in the Grand Rapids City Schools and completed his professional education at the University of Michigan in 1913. He later secured his orthodontic training under Martin Dewey in New York in 1921, and later took a postgraduate course in orthodontics at the University of Michigan under Dr. A. Leroy Johnson. Dr. Spencer served on the State Board of Dental Examiners for many years and was active in the local, state, and national dental societies. He was a Fellow of the American College of dentists and a member of *Omicron Kappa Upsilon*, and *Xi Psi Phi* fraternities. He was an honorary past president of the West Michigan Dental Society, a distinction that in its ninety-one years has been conferred on only one other man. He will long be remembered for his devotion to his family, his patients, and his profession.

Dr. George F. Burke died in Detroit, Michigan, in 1947. For many years he was a member of this Association. In his earlier years he was active in the local and state dental organizations and served on the Board of Dental Examiners for some time. Dr. Burke's health was so critical during the last years of his life that his contact with his professional friends was extremely limited. In his passing, the years unfold and bring to our minds pleasant thoughts of the gracious deeds of his earlier life when his vigor and mental capacity made his friendship a reality of great worth to the older members of our Association.

Dr. Charles Henry Juvet was born in Ottawa, Canada, and died at his home there on April 8, 1948. He was educated at St. Andrews East, Quebec, and Toronto University. He was a member of the Ottawa Dental Society and the American Association of Orthodontists. He was a former member of the Canadian Club, and belonged to the Civil Service Lodge AF and AM, and Rose Croix. He married the former Edith Park. Besides his widow, he is survived by one son, Stanley J., of Ottawa, and one daughter, Mrs. Jack Bottomly, of Victoria, British Columbia.

WHEREAS, The members of the American Association of Orthodontists have learned with profound sorrow of the passing of their fellow members, and

WHEREAS, The members of the American Association of Orthodontists gratefully recognize their outstanding and generous contributions which have so greatly enriched orthodontic practice, and

WHEREAS, Our members grieve over the loss of these beloved members,

THEREFORE BE IT RESOLVED, That this sense of deep bereavement be spread upon the minutes as a memorial to these late members who labored long and faithfully for the benefit of their fellowmen and their profession to which they were so greatly devoted, and

BE IT FURTHER RESOLVED, That a copy of this resolution be sent to the members of their families as an expression of our sympathy and heartfelt condolence.

Respectfully submitted,

THE NECROLOGY COMMITTEE,

LEIGH C. FAIRBANK, Chairman.

Department of Orthodontic Abstracts and Reviews

Edited by

Dr. J. A. Salzmann, New York City

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. J. A. Salzmann, 654 Madison Avenue, New York City

Factors Concerned in the Growth and Development of the Jaws and Teeth: By John E. Harris, *D. Record* **67**: 222-229, October, 1947.

The widely separate phylogenetic (and embryonic) origins of the jaws and teeth would lead one to expect a considerable degree of independence of genetic control over the two, however closely they may become associated in the higher vertebrates. This is confirmed by dental studies on man, where there is often a surprising lack of correlation between the size and structure of the jaw and that of the teeth borne upon it.

Butler (1939) has suggested that there is a fundamental relationship in the tooth patterns of premolars and molars, which is expressed by a gradient of a molarization process rising toward the posterior teeth.

The order of calcification of the deciduous dentition plus the first, second, and third permanent molars shows a definite transition from the anterior to the posterior part of the jaw. It confirms the anatomical evidence that the first, second, and third molars are in reality part of a delayed deciduous dentition and are not homologous with the remaining permanent teeth. The root and cusp pattern of the permanent molars also simulates closely that of the deciduous molars, and a single genetic factor or group of factors probably controls the whole.

The Carabelli tubercle occurs on teeth which probably have a common genotypic pattern and suggests that the abnormality is also genetic in origin. Nevertheless, it occurs most commonly on the second deciduous and first permanent molar, being less common on the first deciduous and absent from the second permanent molar, which suggests that its occurrence is governed by the time of formation of the tooth germ, being limited to those molar teeth whose germs are formed during fetal life.

Why does the premolar develop an entirely different tooth pattern from the deciduous molar which precedes it? It is laid down within the period of development of the molar series and might be expected to be subjected to the same genetic influences. Two answers might be given to this question. One is that environmental conditions (the previous growth of the deciduous molar) have inhibited its development. The other possibility is that there is a fundamental distinction between the first dentition and the second. We are dealing with the replacement of an exostichos by an endostichos, i.e., with teeth developed from different origins in the dental lamina.

If the deciduous dentition and the permanent molars are derivatives of Bolk's parietal row, whilst the remainder of the permanent dentition grows from the terminal row, it may be that competence to react to the "molarization" factor may be limited to the terminal row (exostichos).

It has been suggested that there is a general decrease in jaw size as human evolution progresses—without an equally marked reduction in tooth size.

There is no good reason for supposing that the mutation rates for genes controlling dental growth are of a higher order than those found in all other laboratory studies, so that we are forced to conclude either (1) that our present population is in the later stages of evolving a dominant "normal" type from an earlier "abnormal" recessive ancestral form or (2) that selection pressure is not acting on the system at all. The first hypothesis is controverted by paleontological evidence, and is obviously very unlikely. We are therefore left with the second. It is not, perhaps, unreasonable to assume that our diet nowadays makes so few demands on our dentition that this state of affairs actually exists —though if so it suggests that opportunities for the practice of orthodontics will increase.

I believe hat the primary effect of endocrine variations on arch relationships is likely to be small. The influence of a hormone is highly specific but, if one may draw a mathematical analogy, within that specific field it is likely to have a scalar rather than a vector effect.

Hormones may initiate a response and determine the scale of response, but will be unlikely to affect the mutual relationships of structures which by their nature are likely to be similarly affected both qualitatively and quantitatively by the hormone. The size of both maxilla and mandible may be changed without substantially altering the arch relationships.

Downs found that the incidence of dental anomalies was appreciably higher among those with endocrine dyscrasias; there was no obvious relationship of a particular type of anomaly with a particular form of endocrine disturbance.

The time scale of events in the development and eruption of a set of teeth is so carefully balanced—and yet the process must be determined long before the actual events take place—that one is tempted to consider the possibility of accidental variations not environmentally determined.

It would be fantastic and unnecessary to assume that for every bone in the skull a set of genes exists equal to the number of parameters required mathematically to describe its form—the gene apparatus would run into millions.

The fact that the jaws of present-day man are generally smaller than those of early man may be nothing but an extension of the process which has been going on almost through the whole of vertebrate evolution and which is emphasized by Gregory (1929). This is the reduction in the face, particularly in the jaws, concomitant with an increase in brain size. It is possble to assume that the genetic factors involved in the two were largely separate, and that the fact that the changes were linked together was brought about by the action of natural selection. But it is equally possible that we are dealing with a single change in the relative sizes of the two parts of the skull.

Impaction of Permanent First Molar With Resorption and Space Loss in Region of Deciduous Second Molar: By Virgil D. Cheyne, D.D.S., Ph.D., and Kenneth E. Wessels, D.D.S., Iowa City, *J. Am. Dent. A.* **35**: 774-787, Dec. 1, 1947.

Normally the first permanent molar assumes its position behind the deciduous second molar without initiating resorption, and the second molar is shed near the age of 11 years to be replaced by the second premolar. Pressure resorption as seen in embedded or impacted permanent teeth is rare in the deciduous teeth because these teeth seldom remain unerupted.

A study of fourteen teeth from patients who visited the pedodontic clinic demonstrated that nature does not always provide for the uninterruped appearance of the permanent first molar. In each of the instances considered the first molar was locked distal to the deciduous second molar. This caused premature or pathologic resorption of the roots of the adjacent deciduous tooth with loss

of the tooth, in some cases, several months or years before normal exfoliation time. The consequences of associated space loss on the developing permanent teeth were the chief concern in treatment.

In most instances resorption, from the time of its inception until the tooth is shed, probably covers a period of slightly less than two years. During the two-year period, the permanent tooth is prevented from assuming its full occlusal contact.

It is not necessary to place a space maintainer if the permanent molar erupts and the deciduous tooth can be held in position until the eruption time of the second premolar or if the space does not close too much after loss, based on measurements compared with average widths of premolars. The physiologic age of the child's teeth has considerable bearing on this decision. In older children, the space usually does not close as rapidly as in younger children. Also, early loss of the deciduous molar often hastens eruption of the second premolar, even though it may have little or no root development at the time. If the permanent molar is in an erupted position and locked in occlusion and the difference between the child's dental age and expected eruption time of the second premolar is not greater than six to nine months, the chances are that a space maintainer is not indicated.

Usually there is space loss with resorption and disappearance of interseptal bone, although the governing factor regarding space is the presence of the deciduous molar, whether or not the permanent molar is freed from the lock. Occasionally there is space gained. In other words, one occasionally sees resorption and bone loss without ultimate space loss, but the reverse is never true. In cases of temporary impaction, pressure from the first molar seems to initiate resorption, with the tooth soon moving on to take its proper position in the arch. The process of resorption seldom stops once it has begun nor is there appreciable evidence of regeneration if the bone tissue is involved.

Resorption starting at the cervix can cause an additional complication by cutting off a portion of the apical extremity of the root, leaving it embedded in the alveolus. This accounts for some of the root end fragments of deciduous teeth occasionally observed in roentgenograms of adults.

In most of the cases described in this report, space loss in the region of the premolars, caused by mesial drift of the permanent first molar, is serious because of the early age at which this can occur. If space loss is allowed to develop uninterruptedly, the complications which result offer orthodontic problems which are difficult to solve. In general, if the permanent molar has not erupted and appears to be hopelessly locked, the deciduous second molar should be extracted, and an appliance such as Willet uses should be placed to guide the molar into position. On the other hand, if the molar is partially erupted, an appliance that effects distal movement of the offending permanent molar should be placed.

Impactions occur in the maxilla much more frequently than in the mandible. This may be due to the fact that there is greater potential forward movement of the permanent molars in the upper jaw. Also, since it is known that growth in depth of the face takes place at a greater speed in the mandible than in the maxilla, retardation of bone expansion is likely to be more pronounced at a given time in the maxilla, although it is possible for the two regions to be affected simultaneously.

Salzmann stated that the so-called backward growth of the maxilla normally furnishes sufficient bony support for the three molar teeth. He also said:

"There is a growth area in the mandible along the junction between the body and ramus. The ramus apparently becomes resorbed on its internal angle, allowing more room for teeth, and added bone growth takes place on the external border of the ramus, making the mandible longer. The alternating influences

of increase in size and adjustment of parts occurring in this area allow additional room for the molar teeth to erupt and control the axial inclination of the last developing molars as they move from this site of origin in the rami of the mandible where they eventually erupt into the mouth."

If bony growth does not occur during or preceding the eruptive phases of the tooth, the forces are directed mesially causing the crown of the permanent tooth to butt against the roots of the deciduous second molar. There may be ample growth of the maxilla and mandible distally at a later date, but the misdirected forces incident to the drift in its path of eruption earlier may be of such intensity that locking is continued. This is especially true if the concavity of resorpton is large. If this occurs the result is the same, namely, premature loss of the deciduous tooth, a further shifting of the first molar, with the second premolar eventually erupting out of line. The course is then opened for complicated malocclusion influenced by the simple mesial movement of the permanent first molar. On the other hand, if the mesial drift force is of such low intensity that pressure can be relieved by bony growth, the tooth can pass the region of obstruction and assume its proper position in the arch.

The data concerning fourteen permanent first molars impacted distal to the deciduous second molar, with resulting root resorption and space loss in several instances, are presented in a table. The frequency with which resorption was detected after the first case was diagnosed indicates that this condition is more common than might be suspected. The data presented show that it occurs in approximately one out of fifty persons.

The cases studied were sufficiently different to demonstrate that each patient should be handled more or less individually. It is difficult to formulate general rules when dealing with such variables as age, eruptive forces, and stimulus to bony growth. Nevertheless, it is possible to state that in young persons, if the process of resorption and space loss goes on uninterruptedly, the condition should be watched carefully, the deciduous second molar extracted early, and a space maintainer placed. Otherwise, the second premolar may become impacted or crowded into an abnormal position, or other complications may arise. If it is possible to intercept the progress of such contributing causes of malocclusion in this manner, a long step has been taken in the reduction of complex abnormalities to simpler ones. In older persons, however. if the deciduous molar has been preserved or has remained free from infection and the permanent molar has gained full occlusion, a space maintainer may be avoided if the condition is observed closely.

The accidental finding of deciduous root tips severed and retained as a result of cervical pressure resorption from an unerupted first permanent molar suggests the possibility that this process may account for many of the root tips reported found in adult mouths in the region of the roots of erupted second premolars.

The Face in Profile; An Anthropological X-ray Investigation on Swedish Children and Conscripts: By Arne Bjork. From the State Institute of Human Genetics and Race Biology, Uppsala (Head: Professor Gunnar Dahlberg, M.D., LL.D.) 180 pages with 65 figures. Lund, Berlingska Boktryckeriet, 1947.

This work is an attempt to analyze the nature of prognathism and to investigate certain problems connected therewith, especially those concerning the occlusion of the teeth. Material used in the investigation includes 322 boys 12 years of age, 281 Swedish army conscripts, and a control group of twenty other boys. A review is presented of the various contributions on the measurement of the facial profile. With regard to the Angle classifications Bjork points out

that it was Angle's contention that the position of the upper jaw relative to the cranium is not affected by vagaries of the occlusion and that the position of the maxillary first molar, excluding racial differences, always remains constant in relation to the cranium. Angle's theory, however, has not been borne out by precise measurements. Bjork presents additional evidence that distoclusion may be associated with a protruding upper jaw, a distal position of the mandibular jaw, or a combination of both factors. Seipel also found that the maxillary first molars show sagittal deviation.

Bjork employed profile roentgenograms taken at a distance of 155 centimeters. The method of measurement and error of measurement are described, as are the planes and angles of measurement selected for this study.

The planes and the angles formed by the following facial components have been used in this investigation: A line drawn from the apex of the anterior nasal spine to nasion to the center of sella turcica, to articulare (the point of intersection of the dorsal contour of the articular processes of the mandibular condyle and the temporal bone), to the point of intersection between lines tangent to the base and ramus of the mandible, to a point of intersection between lines tangent to the base of the mandible and to prognion and infradentale. A theoretical discussion on the effect of prognathism when the degree of the various angles and the dimensions of the lines included between the angular points are increased or decreased is presented.

Prognathism may be the total, in which case both jaws protrude, or it may be confined to the upper jaw or to the mandibular jaw alone. A series of diagrams has been included to illustrate the probabilities in prognathism. In each case it is shown that change of one line or an angle of the various lines and angles measured in the facial profile can influence the degree of prognathism.

Theoretically the significance of angular changes is as follows:

1. Reduction of the saddle-angle at sella turcica produces forward displacement of the temporomandibular joint and increases the angle of prognathism, especially at the chin.
2. Reduction of the angle at the temporomandibular joint results in an increase in the degree of prognathism and a shortening of facial height.
3. Diminution of the gonion angle, while affecting mandibular prognathism to varying extent, does not affect the profile of the face.
4. An increase at the chin angle has a pronounced effect on alveolar prognathism and may affect also facial prognathism if there is an accompanying change in the maxillary jaw.

With regard to changes in the various lines, shortening of the cranial base from nasion to the temporomandibular joint gives the appearance of prognathism. If the vertical position of the cranial base alone is shortened, there is a shortening of the facial profile and an increase in facial prognathism. An increase of ramus height causes a slight mandibular prognathism. Elongation of the body of the mandible, especially when accompanied by forward position of the maxillary jaw, is productive of the greatest amount of prognathism.

Of the angular changes largely responsible for increased prognathism we may list reduction in the angle at sella turcica and at the temporomandibular joint or an increase in the chin angle. Line changes affecting prognathism are especially the shortening of the cranial base or an extension of the body of the mandible.

Bjork recognizes the hereditary aspects of prognathism. When hereditary and environmental effects on the facial profile manifest themselves and cause a general increase or decrease in the size, the proportions of the face remain unchanged. It is only in the local manifestations that hereditary and environmental factors give rise to changes in the facial proportions. In summary it

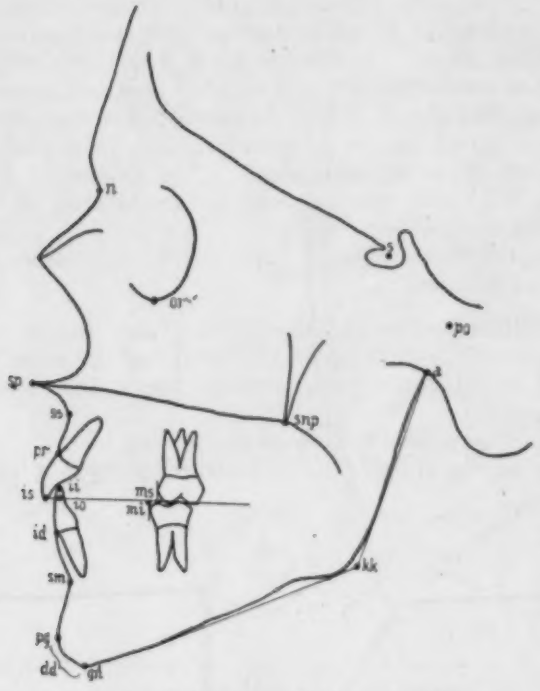


Fig. 1.—Reference points employed.

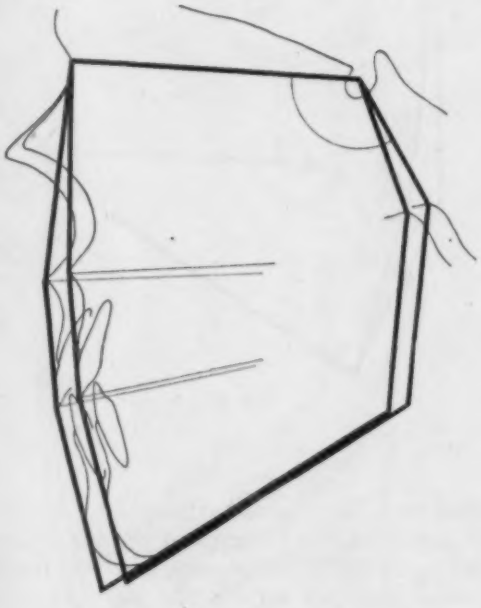


Fig. 2.

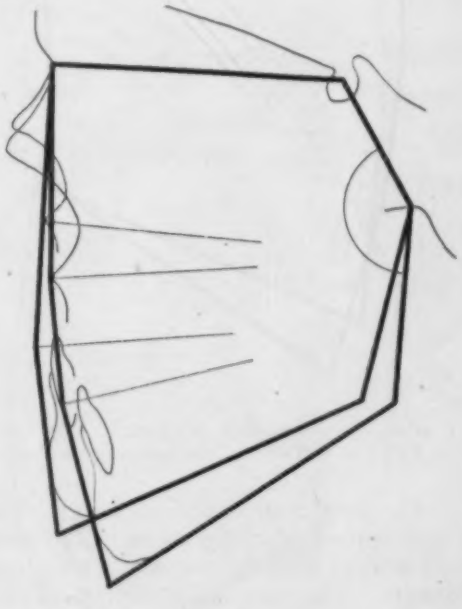


Fig. 3.

Figs. 2-10.—Illustrating theoretically feasible changes in the facial diagrams and the effect of such changes on the prognathism. Only one of the factors determining the size and shape of the facial diagram is varied in each drawing. Figs. 2-5 relate to angular changes, while Figs. 6-10 illustrate linear changes.

Fig. 2.—Diminished saddle angle. (Decrement 10°.)

Fig. 3.—Diminished joint angle. (Decrement 10°.)

may be stated that extreme maxillary prognathism, according to Bjork, is caused by diminution of the angles at sella turcica and the temporomandibular joint and an increased chin angle. A shortening of the forward part of the cranial base and an increase in the length of the jaws also contribute to the degree of prognathism. While the shape of the facial skeleton and the shape and size of the cranial base are direct causes of prognathism, increased length of the jaw is but a contributory cause in some cases. The degree of prognathism, therefore, in each individual case depends on the interaction of the various factors causing prognathism.

Possible causes of deviations in mesiodistal relations of the occlusion of the teeth are given as follows:

1. A relative difference in the size of the jaws due to increased length of the maxilla or, conversely, reduction in the length of the mandible.
2. Differences in alveolar prognathism producing local changes in the alveolar arches alone.
3. Prognathism due to inclination of the incisor teeth.
4. Mobility of the mandible in a forward direction at the temporomandibular joint.

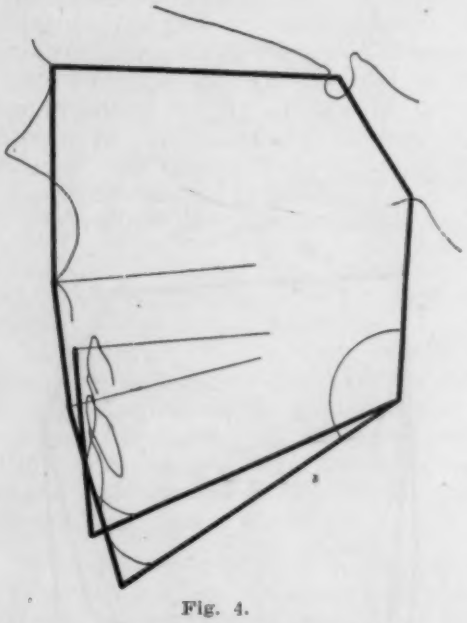


Fig. 4.

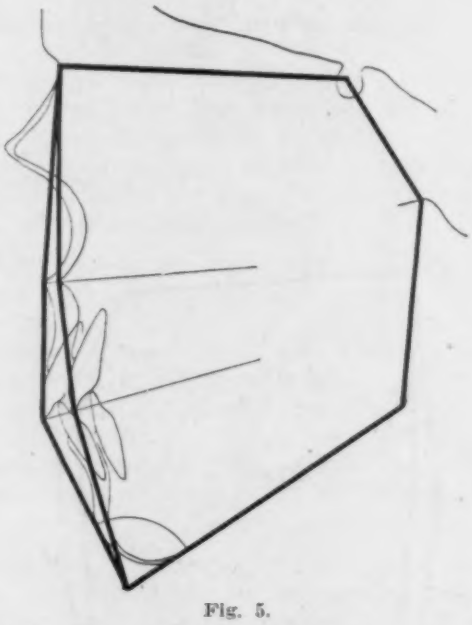


Fig. 5.

Fig. 4.—Diminished jaw-angle. (Decrement 10°.)
Fig. 5.—Increased chin angle. (Increment 10°.)

The most significant cause of increased maxillary prognathism and overjet is that caused by differences in the size of jaw length. Overjet of the maxillary teeth and maxillary prognathism alone are attributed to changes in the facial diagram. Changes in the shape of the facial diagram my also be significant in mandibular prognathism. Bjork concludes his analysis of the causes of increased maxillary overbite by stating that the variations in the occlusion are secondary to the degree of prognathism existing in the jaws themselves while the inclination of the teeth and the alveolar processes are contributory causes.

Of the three main causes of mandibular overbite only the relative difference between the length of the jaws themselves is important while changes within the occlusion itself are secondary. Alveolar and basal prognathism tend to be

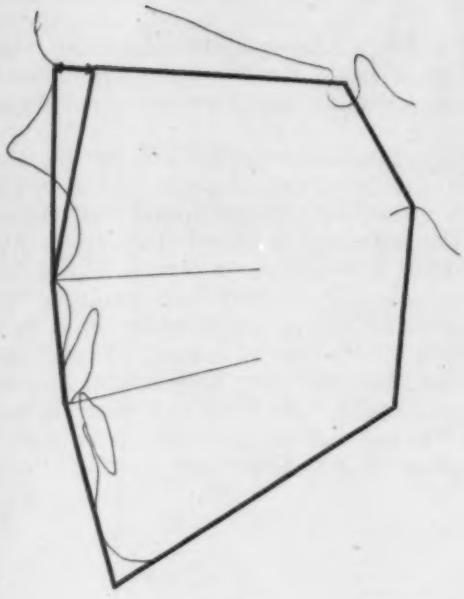


Fig. 6.

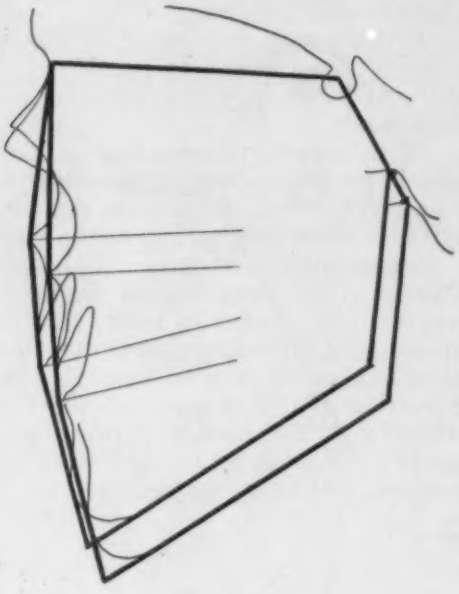


Fig. 7.

Fig. 6.—Horizontal part of cranial base shortened. (Decrement 10 mm.)
Fig. 7.—Vertical part of cranial base shortened. (Decrement 10 mm.)

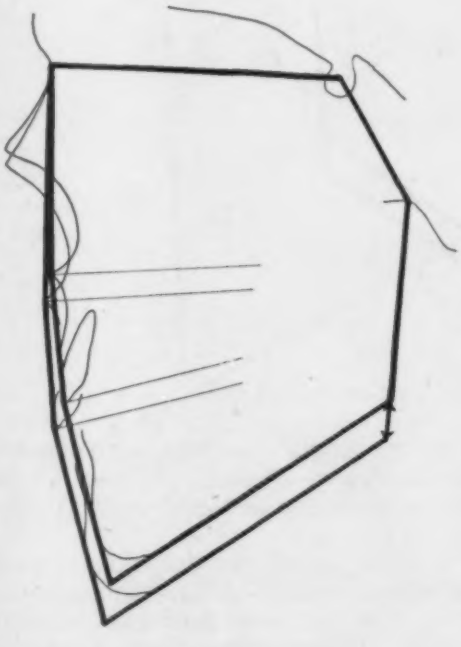


Fig. 8.

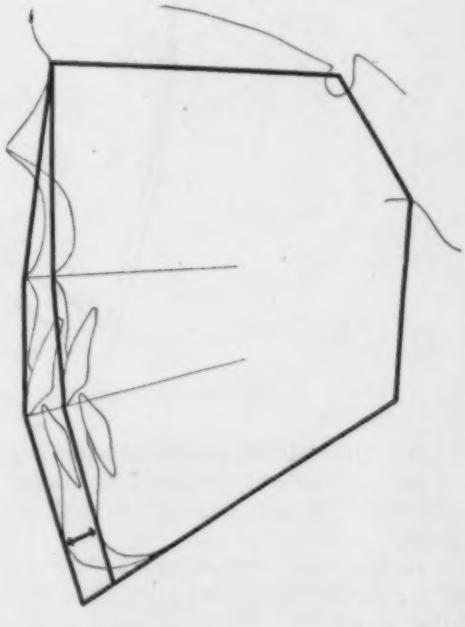


Fig. 9.

Fig. 8.—Enlarged ramus height. (Increment 10 mm.)
Fig. 9.—Elongated lower jaw. (Increment 10 mm.)

concomitant. In other words, the alveolar process is more prognathic in individuals with long jaws.

Persons with deep overbite showed a reduction in total facial height when measured from nasion to gnathion. The underlying factor of deep overbite is shown to be an approximation of the jaws, causing the face to be somewhat compressed.

With regard to crowding of the teeth it was shown by Lundström that there is no correlation between the size of the teeth and the size of the dental arches. Therefore, large teeth can produce crowding. Seipel found that crowding bears some relationship to the size of the jaws and is found more frequently in persons with short faces. Bjork also found a reduction in length of the face in persons with crowding of the dental arches. There were no significant differences with respect to inclination of the maxillary or mandibular incisors in persons with crowding and without crowding of the dental arches. This, Bjork points out, is contrary to Tweed's contention that crowding results in a forward inclination of the incisors. Aside from pathologic cases in which there is malformation of the jaws, this investigation has not found crowding to be accompanied by a reduction in jaw size. Loss of teeth was found not to affect facial measurements to any noticeable degree.

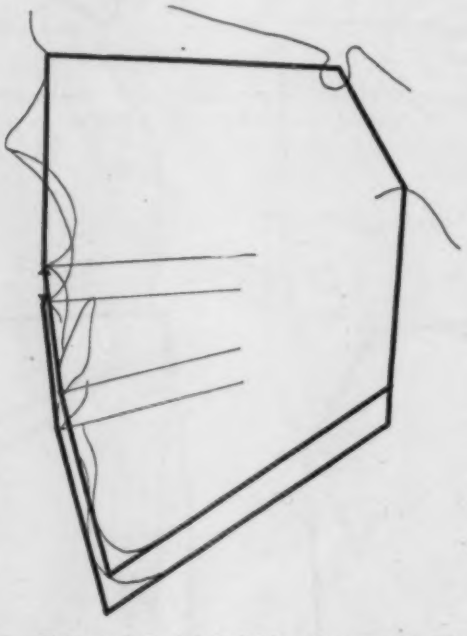


Fig. 10.—Enlarged facial height. (Increment 10 mm.)

An analysis of overbite with regard to the Angle classification shows that overjet is positively related to molar relationship of Class 2, Division 1 type, while overbite is positively related to molar relationship of the Class 2, Division 2 type.

In his examination of 12-year-old boys, Bjork found that mandibular prognathism is relatively smaller than maxillary prognathism in comparison to that found in adults. This indicates a straightening of the facial profile in the adult. On the other hand, the relative increase in mandibular prognathism during the growth period is equalized in some measure at the chin angle which becomes smaller. This, he points out, is necessary in order to avoid major changes in

the occlusion of the teeth. This is the only angular change that was noted during the growth period.

The linear measurements of the face showed steady increase during growth. The angles at sella turcica and the temporomandibular joint do not alter during growth while the angle at the chin becomes smaller in the adult.

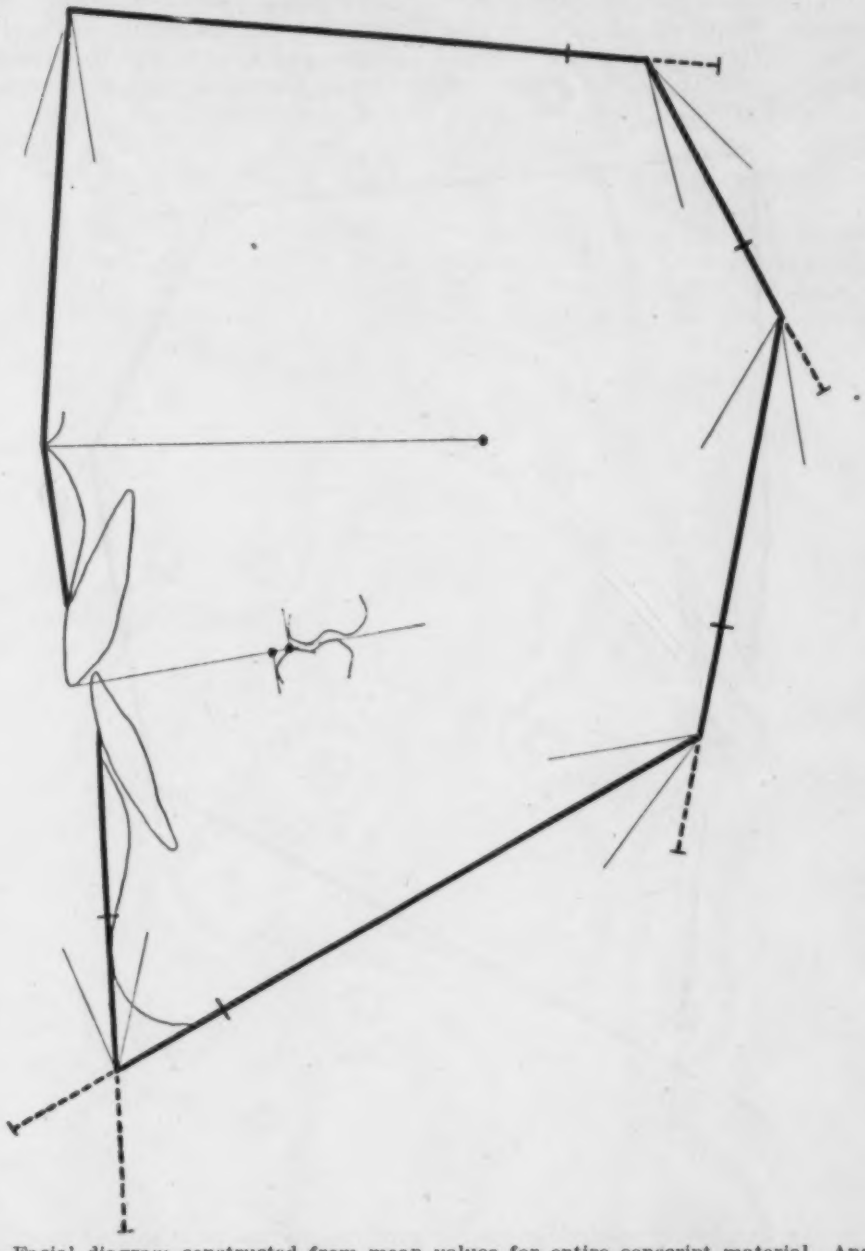


Fig. 11.—Facial diagram constructed from mean values for entire conscript material. Angular and linear variation ranges are indicated by means of thin lines. Natural size diagram.

Increase in prognathism in the adult as compared to the 12-year-old boys is due to changes in the linear dimensions with length of the jaws exceeding length of the cranial base. The percentage of increase of the height of the

ramus is twice that of the body of the jaw of the mandible and is responsible for a secondary increase in mandibular prognathism in relation to the maxillary jaw. The investigation of the 12-year-old boys shows that the degree of prognathism, while intimately connected with the shape of the basal portion of the cranial skeleton and the shape and size of the cranial base, is only to a lesser extent dependent on the length of the jaws. Alveolar prognathism shows a tendency to diminish during growth. This reduction cannot be ascribed to the difference in the loss of teeth between the two age groups but is attributed to increased crowding of the incisor teeth in the mandible and increased width of the dental arches between the age of 13 and adulthood.

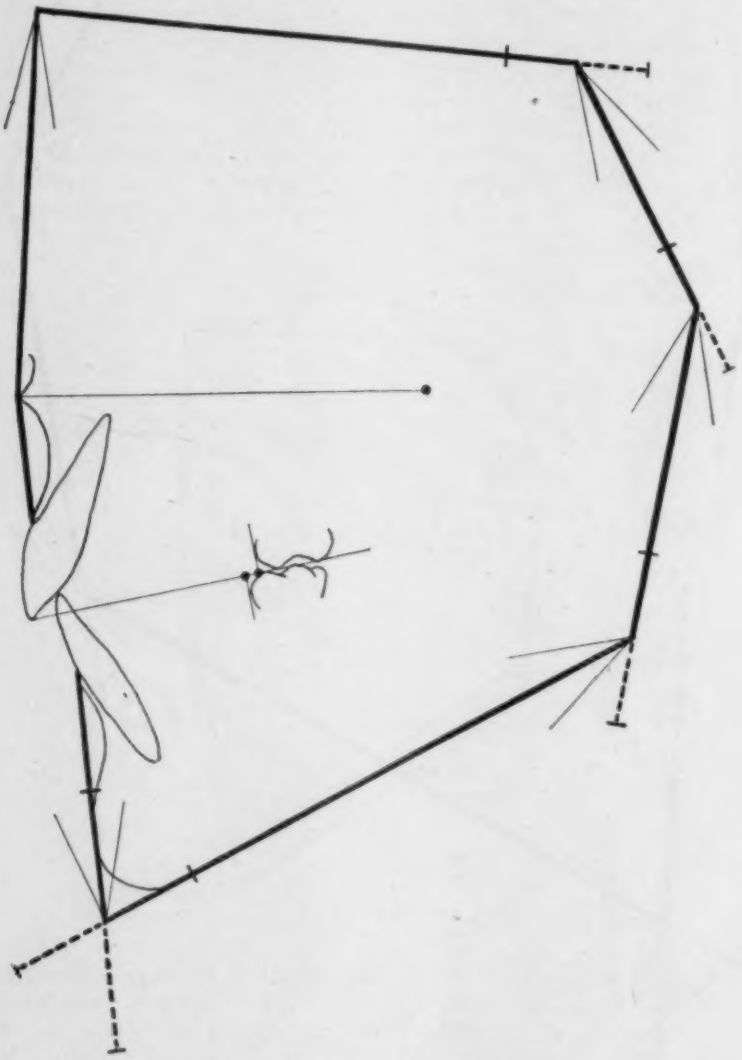


Fig. 12.—Facial diagram constructed from mean values for the entire boy material. Angular and linear variation ranges are indicated by means of thin lines. Natural size diagram.

Bjork's work confirms Brodie's findings with regard to constancy of angular and linear growth of the jaw with the exception that the former found that there is an increased angle of prognathism and a reduction in the chin angle in adults in comparison to the 12-year-old group. Linear growth changes of

the various parts of the face vary widely, while the cranial base shows an increase of 6 to 8 per cent, and length of the jaws increase by 10 to 11 per cent. Greater increase in length of the jaws in comparison to that of the cranial base increases the degree of prognathism of both the jaws.

Frontal height of the face from nasion to gnathion increases by 13 per cent during the growth period between the ages 13 to 21-22 years. Of this increase, that of the upper jaw nasion to upper incisor is 10 per cent while that in the lower jaw from the lower incisor to gnathion is 15 per cent. Growth increase in height of the ramus is 26 per cent. The mandibular jaw is displaced forward slightly relative to the upper jaw, this being secondary to the increase in the height of the ramus. With the increase in the angle of the mandibular prognathism there is straightening of the facial profile from nasion to prosthion to progonion.

This investigation will be found interesting and useful and will do much to correlate growth of the various facial components with their relationship to prognathism. The various measurements provided by Bjork for the lines and angles offer excellent tables of comparison which should be useful in case analysis to the practicing orthodontist.

J. A. Salzmann.

News and Notes

The 1949 Annual Meeting, American Association of Orthodontists, May 2, 3, 4, 5, and 6, 1949, Commodore Hotel, New York, N. Y.

In addition to the unusual attractions which the city of New York holds forth to visitors, there will be many other important reasons why orthodontists will want to come to New York City to attend this meeting. A four-and-one-half day meeting is being planned, beginning on Monday, May 2, and closing at noon on Friday, May 6. Out-of-town members and their families will thus be able to spend one or two extra week ends in New York City.

Monday, May 2, 1949, will be given over to sight-seeing and entertainment for the ladies and a day of sports for the men. Whether or not you are an active sport participant is not important. The fact remains that you will enjoy the good fellowship which will be provided for you. All day Tuesday, Wednesday, and Thursday, and Friday morning will be devoted to scientific presentations including clinics and motion pictures.

It is planned to include on the program five or six papers, each of about forty-five minutes in length, and a number of shorter papers and outstanding motion pictures illustrating various orthodontic techniques. In addition to the usual table clinics, time will be allotted to the presentation of a number of limited attendance clinics. These clinics will take a little more than an hour for presentation and will be repeated as necessary. Everyone will have an opportunity to attend at least two of the limited attendance clinics.

With the full realization of the important research bearing on orthodontics which is being conducted by workers in many institutions, one session of the meeting will be set aside for the presentation of research papers. These will be limited in length to allow for as many papers as possible during the session.

Many times in the past orthodontists have felt that papers presented before them did not sufficiently stress correlation of the subject to actual practice. At this meeting papers will bear directly on the application of the subject to actual treatment of patients. This meeting will be a "take home" meeting. Essays and clinics will provide information of practical value as well as scientific enlightenment.

During the course of the meeting there will be a Ketcham Award Session, a President's Reception and Banquet, and other features.

This is a preliminary announcement of the meeting. More detailed information will appear in subsequent issues of the JOURNAL.

LOWRIE J. PORTER, President.

Northeastern Society of Orthodontists

The Fall Meeting of the Northeastern Society of Orthodontists will be held at the Hotel Commodore, New York, N. Y., on Nov. 22 and 23, 1948.

Central Section of the American Association of Orthodontists

The regular annual meeting of the Central Section of the American Association of Orthodontists will be held Oct. 25 and 26, 1948, at the Corn Husker Hotel, Lincoln, Nebraska.

Great Lakes Society of Orthodontists

The Nineteenth Annual Meeting of the Great Lakes Society of Orthodontists will be held Oct. 18 and 19, 1948, at Hotel Statler in Cleveland, Ohio.

Dr. F. Copeland Shelden, Dr. Ashley E. Howes, Dr. B. Holly Broadbent, and Dr. Samuel Chase will be the essayists.

Table clinics will be presented. Time for fellowship is essential to all outstanding meetings. Please make your hotel reservations in ample time. We do not want you to be inconvenienced.

Southern Society of Orthodontists

The Southern Society of Orthodontists will hold its annual meeting Oct. 11, 12, and 13, 1948, at Hotel Peabody, Memphis, Tennessee.

Fifth Annual Seminar for the Study and Practice of Dental Medicine

Initial plans for the Fifth Annual Seminar for the Study and Practice of Dental Medicine to be held at the Desert Inn, Palm Springs, California, Oct. 17-22, 1948, were announced recently by Dr. Hermann Becks, Seminar President.

In view of the widespread interest in the topical application of fluoride which has rapidly reached epidemic proportions throughout the nation, this subject will be one of many to be critically discussed during the forthcoming Seminar, Dr. Becks stated.

Research versus the high cost of eating will be demonstrated by actual experiment when experts in medical dentistry and allied professions congregate.

Dr. Michael Walsh, national authority on nutrition and diet, will conduct special sessions and demonstrations on nutrition in action designed to show the practical mechanisms for putting nutrition into action at the community level.

Special menus created from recipes prescribed by Dr. Walsh will be featured at all meals of the Seminar and will include a variety of breads, experimentally made to evaluate the difference between the "conventional" mass-produced breads and "custom-made" breads made from freshly ground whole grains without the addition of sugars, molasses, or honey.

Sea foods and special meats will be prepared and served in such a manner as to demonstrate how appetizingly they can be used as major dishes while furnishing excellent nutrients to the diet.

President of the Seminar is Dr. Hermann Becks, Professor of Dental Medicine at the University of California. Other outstanding lecturers scheduled include:

Lieutenant Colonel Joseph L. Bernier, D.D.S. M.S., of the Army Medical Museum, Washington, D. C., Dr. Stafford L. Warren, First Dean of the New Medical School of the University of California; Dr. George W. Beadle, Professor of Biology and Chairman of the Division, California Institute of Technology; Dr. Paul Popenoe, Director of the American Institute of Family Relations in Los Angeles; Lieutenant Commander Carl A. Schlack, D.D.S., Head of the Dental Branch of the Medical Sciences Division, Office of Naval Research, Washington, D. C., Dr. Warren L. Bostick, Assistant Professor of Pathology at the University of California; and Dr. Charles H. M. Williams, Associate Professor of Paradentics at the University of Toronto.

Dr. Herbert I. Margolis Elected President of Massachusetts Dental Society

Dr. Herbert I. Margolis, well-known orthodontist, was elected president of the Massachusetts Dental Society at the Eighty-fourth Annual Meeting in the Hotel Statler, Boston, May 3, 4, 5, and 6, 1948. Particularly well known are his manuscripts published in the past in the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY on research in growth, development, and cephalometrics.

European Orthodontic Society

The European Orthodontic Society will hold its Twenty-fifth Annual Congress in London, England, on July 16, 17, and 19, 1948. The program as announced will be as follows:

Dr. B. Holly Broadbent	(U. S. A.).	Title pending.
Dr. Cauhepe	(France).	Unilateral Roentgenotherapic Atrophy of the Ramus.
Professor Friel	(Eire).	Migrations of Teeth Subsequent to Extractions of Deciduous and Permanent Teeth.
Professor Hoffer	(Italy).	Short paper on indications for the Norwegian system.
Dr. Lundstrom	(Sweden).	An Investigation of 202 Pairs of Twins, Regarding Fundamental Factors in the Etiology of Malocclusion.
Dr. Clare Madden	(U. S. A.).	Applications of the Teachings of Dr. Johnson and the Twin Wire Appliance.
Professor E. Muzi	(Italy).	New Studies on Facial Morphology.
Mr. Ernest Rix	(England).	Title pending.
Professor M. Schwarz	(Austria).	On the Indication of the Various Modern Methods of Treatment in Orthodontia.
Dr. Seipel	(Sweden).	Prevention of Malocclusion.
Dr. M. F. Watry	(Belgium).	A Contribution to the History of Facial Therapeutics in Maxillo Facial Orthopedy.

Norway (author and title not yet known).

TABLE DEMONSTRATIONS

Dr. de Costor	(Belgium).	Anatomical Appliance, Both Fixed and Removable.
Dr. Crozat	(U. S. A.).	Removable Appliances of Precious Metal. Their Construction and Application.
Mr. Walpole Day	(England).	The Effect of Injury to the Temporomandibular Joint on the Growth of the Mandible.
Dr. Duysings	(Holland).	Title pending.
Mr. Endicott	(England).	Title pending.
Dr. Grossman	(England).	Title pending.
Dr. Hoffer	(Italy).	Indications for the Norwegian System (title pending).
Dr. Kantorowicz	(Turkey).	A Device for Marking the Porion on Telescopic X-ray Photographs.
Dr. Kjellgren	(Sweden).	Early Dental-Orthopedic Treatment, Combined With Surgery in Some Cases of Harelip and Premaxillary Defect.
Dr. A. F. Jackson	(U. S. A.).	Title pending.
Dr. Clare Madden	(U. S. A.).	Twin Arch of Johnson.
Dr. Neumann	(Czechoslovakia).	Title pending.
Dr. Noble Powell	(U. S. A.).	Title pending.
Dr. M. Schwarz	(Austria).	Some Useful Accessories on Removable Appliances.
Dr. Wachsmann	(Czechoslovakia).	Title pending.

Washington University School of Dentistry Postgraduate Course For Orthodontists

A postgraduate course in the Johnson twin arch technique was held at Washington University School of Dentistry, May 3 to 8, 1948.

The course was under the direction of Joseph E. Johnson, D.D.S. He was assisted by Clare Madden, D.D.S., George Crozat, D.D.S., James E. Rook, D.D.S., and Earl E. Shepard, D.D.S.

Admission to the course was limited to persons in the exclusive practice of orthodontics and to teachers or graduate students of orthodontics. It was attended by orthodontists from nine states.

Dr. George R. Moore to Give Series of Lectures in the Netherlands

Dr. George R. Moore, Head of the Orthodontic Department of the University of Michigan School of Dentistry and Secretary of the American Association of Orthodontists, has been invited to the Netherlands to give a series of lectures dealing with the techniques of orthodontics which can be used by general practitioners. He also will visit several other countries.

The conference is one of several sponsored by Princess Juliana to acquaint Dutch medical men and dentists with research and practices developed in America during the war years.

The conference will be held in July, and on July 19 Dr. Moore will appear on the program of the European Orthodontic Society in London. Dr. Moore will return to America about August 5.

Presentation to Dr. Oren A. Oliver

On April 20, Dr. Oren A. Oliver of Nashville, Tennessee, was presented a certificate by the International Dental Society for "strengthening international cooperation." Along with the certificate, the only one of its kind in existence, he was presented with a silver goblet created by British craftsmen in 1790.

The presentation was made at the Second District Dental Society in Nashville, Tennessee, by Dr. E. A. Rowlett, President of the International Federation.

Notes of Interest

H. B. Bolt, D.D.S., announces his retirement Aug. 1, 1948, and the continuance of his offices and practice of orthodontics by his associate, George R. Webber, D.D.S., M.D.Sc., Enid, Oklahoma, First National Bank Building, phone 2557, hours, 9:00—5:00 except Thursday.

Dr. Otto W. Brandhorst, D.D.S., announces the association of his son, William S. Brandhorst, D.D.S., for the practice of orthodontics, Medical Arts Building, 4952 Maryland Avenue, St. Louis, Missouri.

John T. Crouch, D.D.S., M.S., announces the opening of his offices in association with S. Stuart Crouch, D.D.S., at 185 St. Clair Avenue West, Toronto, telephone, RA. 8835, practice limited to orthodontics.

S. Stuart Crouch, D.D.S., announces the removal of his offices from the Physicians and Surgeons Building to 185 St. Clair Avenue West, Toronto, telephone, Kingsdale 1647, John T. Crouch, D.D.S., M.S., Associate, practice limited to orthodontics.

Frank P. Gilley, D.D.S., M.S.D., announces the opening of an office at 31 Central Street, Bangor, Maine, practice limited to orthodontics, office phone, 6324.

Dr. Arthur V. Greenstein, 1 West 81st Street, New York 24, N. Y., announces the association of Dr. Irving Buchin, practice limited to orthodontics.

Henry Kaplan, D.M.D., announces the opening of his office at Haddon Hall, 29 Commonwealth Avenue, Boston, Massachusetts, practice limited to orthodontics, telephone, COmmonwealth 6-5552.

Dr. Daniel B. Lewis announces the opening of his office at 415 Rugby Building, Owensboro, Kentucky, office hours 9-5 Monday, Tuesday, and Saturday, practice limited to orthodontics, telephone, 883.

Dr. B. E. Phillips wishes to announce the removal of his office from 1306 First National Bank Building, Salt Lake City, Utah, to 2943 Broadway, Redwood City, California, practice limited to orthodontics.

OFFICERS OF ORTHODONTIC SOCIETIES

The AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY is the official publication of the American Association of Orthodontists and the following component societies. The editorial board of the AMERICAN JOURNAL OF ORTHODONTICS AND ORAL SURGERY is composed of a representative of each one of the component societies of the American Association of Orthodontists.

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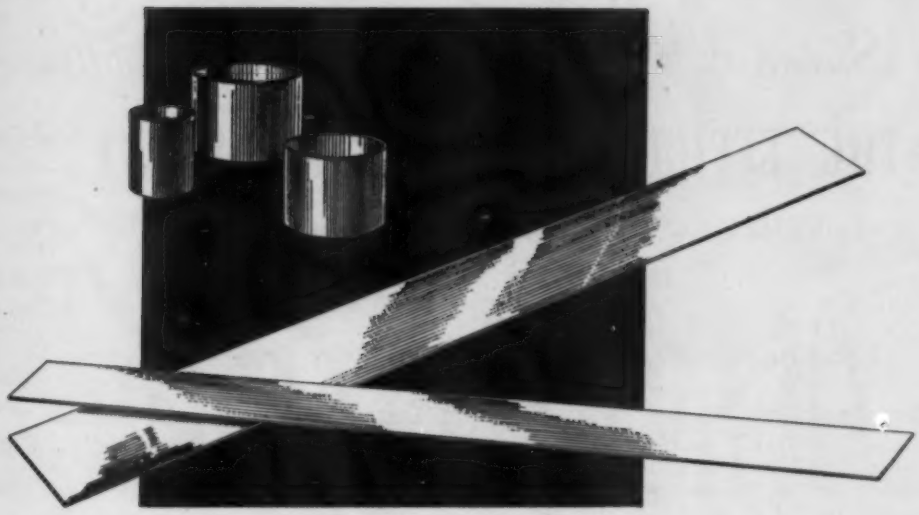

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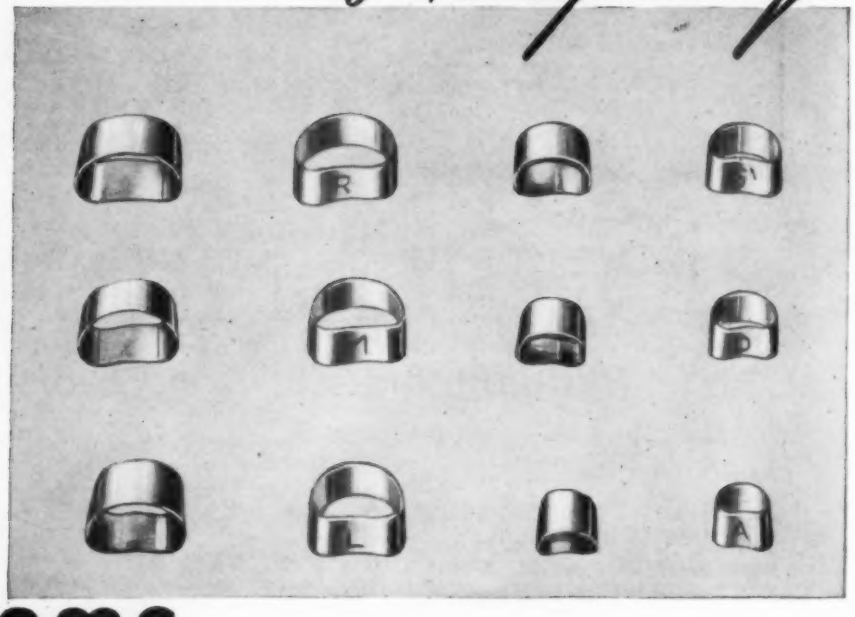

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